ENCYCLOPEDIA YEAR BOOK

The Story Of Our Time

Don Gibbins

ENCYCLOPEDIA YEAR BOOK

THE STORY OF OUR TIME

LICK OBSERVATORY

1961

ENCYCLOPEDIA YEAR BOOK

THE STORY OF OUR TIME

No part of this book may be reproduced without special permission in writing from the publishers

Copyright © 1961 by Grolier Incorporated
Copyright © in Canada 1961 by The Grolier Society of Canada Limited

Library of Congress Catalog Card Number: 48–171

TABLE OF CONTENTS

PAGE
COMMENT AND OPINION 14

The Year Evaluated

Highlights of the Year 16

What They Said When It Happened

The Experts We Need 24
Canada's Trade Deficit 26
The U-2 Incident 28
The Communist Posture, Summer 1960 31
The Game of Canadian Politics 35
End-of-the-Year Cartoons 38

The Encyclopedia Year Book Asks:

How Do You Feel about Man's Attempt to Conquer Outer Space? 40
What Is the Cause of Slumps in Baseball? 45
A SUMMING UP 48
News Events of 1960 50
World Leaders Meet at the United Nations 80
Headliners of Our Time 82
Among Those Who Died 84
NEWS AROUND THE WORLD 86

United States and Canada

The Road to Civil Rights 88
The United States Elections—1960 91
Farm Subsidies 94
The Beats 97
The Electoral College 100
The United States: The Prospect Ahead 102
The Three-Mile Limit 106

News from Abroad

Australia—Business Frontier 108
Desert Oil for France 111
Latin America in 1960 115
Apartheid 120
How Good Is Soviet Education? 123

International Affairs

Variations on the Communist Theme 127
The New Diplomacy 131
The Third Force in the UN 134
New Communist Tactics in Southeast Asia 137
Mr. Khrushchev's Economic War 141

Facts and Figures

Swift March toward Freedom 146
United States: Budget and Taxes 148
First Report on the United States Census 150
The 1959 Soviet Census 153
The Population of Canada 154
The 1960 United States Elections 156

PAGE
MEN, MONEY AND MACHINES 158

Aviation

Air Taxis 160
Private Flying 162
Faster Air Travel—on the Ground 164
Aviation in 1960 166

Business and Finance

Consumer Credit 169
Conventions Are Big Game 173
Japan—World Trader 176
Finding the Right Man 179

Industry

Explosives Up-to-Date 182
Miniature Giants 185
Canada Boosts Gas Exports 188

Modern Trends on the Highway

Safety on the Highways 191
Motels Come of Age 194

Facts and Figures

Employment Patterns in the United States—Past and Future 198
Balance of Trade 200
Advertising in the United States 202
Private Flying in the U. S. 204
Motor-Vehicle Accidents in the United States 205
Health Insurance and Medical Costs in the United States 206
United States Labor: Union Membership and Work Stoppages 208
China's Growth and the Early Soviet Rate 209
The Economy of Latin America 210
SCIENCE IN OUR TIME 212

Agriculture

Turf-Grass Culture 214

Astronomy

Voices from Other Worlds 217

Atmosphere

The Earth's Atmosphere and Beyond 220

Biology

Virus Breakthrough 223

Conservation

Water-Pollution Control 226

Geology

Tsunamis: Terror in the Pacific 229

Health and Medicine

Studies toward a Longer Life 232
What Do You Weigh? 235

TABLE OF CONTENTS (cont.)

PAGE

SCIENCE IN OUR TIME (cont.)

Meteorology
Meteorology Enters the Space Age 237
Ornithology
Bird Flight 242
Physics
The Uses of Extreme Cold 246
The Promise of Thermoplastic Tape 249
The Wankel Rotating Combustion Engine 252
Space
The Year in Space 257
The Missile Gap 263
Science Highlights
Lise Meitner 268
Science Highlights in 1960 270
Facts and Figures
Satellites at Work 278
Building Blocks of Nature 280
Atomic Energy: The Modern Power Source 281
Mental Illness in the United States 282
Less Food, More Nutrition 284
The Fight against Malaria 286
Prizes and Awards: Science 287

BOOKS, MUSIC AND ART 288
Art
Review of Art in 1960 290
Danish Design for Today 294
Dance
Dance in 1960 298
Libraries and Museums
Rural Libraries 302
Mystic Seaport—Living Museum of the Sea 304
Literature
The Bookshelf of 1960 307
The Civil War in Books 311
Music
Music in 1960 314
Review of Records, 1960 318
Birgit Nilsson 322
Facts and Figures
Mounting Interest in Music 324
Prizes and Awards: Books, Music and Art 325

SCHOOLS AND EDUCATION 326
Problems
The American Educational System and Its Critics 328

PAGE

SCHOOLS AND EDUCATION (cont.)

New Techniques
Team Teaching 332
Teaching Machines 335
MPATI—Experiment in Education 338
New Look
Changes in Science Teaching 341
Campus Layout for High Schools 344
Vertical Campus 346
Facts and Figures
Growing Pains in United States Education 348
Increase in Language Studies 349
Student-Exchange Programs 350

SHOW BUSINESS 352
Motion Pictures
The Film Year in Review 354
The World of Ingmar Bergman 359
Television and Radio
Review of TV and Radio 362
Pay TV 369
Theater
On Stage! 373
Economics of the Theater 377
Facts and Figures
Foreign Motion Pictures in the United States 381
Prizes and Awards: Show Business 382

RECREATION AND SPORT 384
Creative Pastimes
Ship-Model Building 386
Wild-Flower Gardening 388
Fishing Tackle—New Trends 391
Shell Collecting 394
Sport Parade
Gridiron Pros 396
Big Boom in Bowling 399
Judo Has Them Flipping 402
Sports Pictures of 1960 404
Facts and Figures
World Travel 410
The 1960 Winter Olympic Games 412
The 1960 Summer Olympic Games 413
Sports Summary of 1960 416

INTERNATIONAL PRIZES AND AWARDS 418

QUIZ:
What's Your Reading Score? 418

ALMANAC FOR 1961 420

INDEX 421

Editorial Director
LOWELL A. MARTIN

Editor in Chief
MARIAN LOCKWOOD

Illustration and Editorial Production Director
PAUL H. CASSIDY

EDITORIAL STAFF

Managing Editor
DOROTHY CAREW

Assistant Editor
BRYAN BUNCH

Contributing Editor
HELEN HYNSON MERRICK

Production Editors
HELEN RIEHL HITCHCOCK
CHARLES PAUL MAY
EILEEN DAVIS

Copy Editor
J. M. A. RAIKES

Assistant Copy Editors
LORRAINE ABELSON
RUTH RICHTER
MYRA ROSENBERG
PAUL M. TAFFAE

Indexer
KATHLEEN LEERBURGER

ILLUSTRATION STAFF

Design and Make-up Editors
ISABEL VESA
EDWARD ZYTKO

Art Supervisor
GLADYS D. CLEWELL

Illustration Assistants
MARY BOWEN
CHARLES FARRELL
MIMI KAIL
MARJORIE KOTKOFSKY

LIST of CONTRIBUTORS

DIANA BARTLEY, contributor of automotive articles to *Esquire*, is the American correspondent for *L'Automobile, Auto Italiana, Motor Racing, L'Argus, Das Auto* and other magazines.

The Wankel Rotating Combustion Engine — *Page 252*

GEORGE A. W. BOEHM is an Associate Editor, *Fortune* Magazine. He was formerly an editor of *Newsweek, Control Engineering* and *Scientific American.*

Voices from Other Worlds — *Page 217*

NUNZIA A. BONGIORNO is Managing Editor of *Grolier Encyclopedia.*

The United States Elections—1960 — *Page 91*

BERNARD BRENNER is Farm Editor, United Press International. He has contributed articles to *Reader's Digest, Coronet, Farm Journal, Nation's Agriculture* and *Better Farming Methods.* Since 1952, Mr. Brenner has been in Washington, writing a daily farm script for the UPI radio service and covering agriculture and related fields both in the executive branch and on Capitol Hill for the UPI newspaper and radio wires.

Farm Subsidies — *Page 94*

JOE BROOKS has been described as probably "the world's best fly-fisherman" and has fished in many countries throughout the world and in all but two states of his native United States. His specialty is light-tackle fishing, particularly with the fly rod. His first two books, *Bass Bug Fishing* and *Salt Water Fly Fishing*, are classics in their fields. He is also the author of numerous articles and the following books: *Greatest Fishing, Where to Find It; A Guide to Bermuda Fishing* and *The Complete Book of Fly Fishing.*

Fishing Tackle—New Trends — *Page 391*

JIM BROSNAN, writer and author, is a Cincinnati Redlegs player and author of the book *The Long Season.*

What Do You Think Are the Causes and Cures for Slumps in Baseball? — *Page 45*

HUGH BROWN is Sports Columnist, *The Philadelphia Bulletin.* Mr. Brown has been in newspaper work since 1927 and has contributed many articles to *The Saturday Evening Post, Sport Magazine, Pro Football Yearbook, Baseball Yearbook* and so on.

Gridiron Pros — *Page 396*

BRYAN BUNCH was formerly Assistant Editor of *Encyclopedia Year Book, The Story of Our Time.*

News Events of 1960 — *Page 50*
Miniature Giants — *Page 185*
Facts and Figures — *Passim*

BEDFORD BUNDY is a free-lance writer who became interested in judo when he was stationed in Asia during World War II.

Judo Has Them Flipping — *Page 402*

ROBERT H. BURGESS is Curator of Exhibits, The Mariners Museum, Newport News, Virginia. His interest in ships has been largely historical; he has the largest private collection of relics of and from Chesapeake Bay ships, sail and steam, made up mostly of carved ship decorations. Mr. Burgess specializes in wood carving of wingspread eagles. He has contributed hundreds of articles on maritime subjects to magazines, newspapers and reference works.

Ship-Model Building — *Page 386*

DOROTHY CAREW, Managing Editor, *Encyclopedia Year Book*, has contributed to various national magazines. Miss Carew was formerly a staff member of Associated Press Business and Financial News Department, New York City; of the United Press Paris Bureau, and of the Youngstown, Ohio, *Vindicator.*

Japan—World Trader — *Page 176*

SYDNEY CHAPMAN, D.Sc., English mathematician, geophysicist and astronomer, is Advisory Scientific Director, Geophysical Institute, University of Alaska, and member of research staff, High Altitude Observatory, Boulder, Colorado. Dr. Chapman, who was President of the Central

Committee (1953–59) for the International Geophysical Year, is the author of *IGY, Year of Discovery; Geomagnetism* (with J. Bartels); and *Mathematical Theory of Non-Uniform Gases* (with T. G. Cowling).

The Earth's Atmosphere and Beyond *Page 220*

MARTHA COMPTON, writer and lecturer, is a gardener of some thirty years of experience. She lectures widely in the Middle West on various aspects of gardening and horticulture. Mrs. Compton is the author of a weekly column which is to be published in book form under the title *Life in the Country.*

Wild-Flower Gardening *Page 388*

JUDITH CRIST, Editor for the Arts, *New York Herald Tribune*, is a feature writer on the drama for that newspaper. She has written for various national magazines, among them *Redbook, Reader's Digest* and *Columbia University Forum.*

Economics of the Theater *Page 377*

WATSON DAVIS, Director of Science Service, is Editor of *Science News Letter* and of the monthly magazine *Chemistry.*

Science Highlights in 1960 *Page 270*

NICHOLAS G. DEMOS is Assistant Editor, *The Book of Knowledge.*

Birgit Nilsson *Page 322*

LAURENCE L. DOTY, JR., is Transport Editor of *Aviation Week.*

Aviation in 1960 *Page 166*

LEWIS D. EIGEN is Mathematics and Science Director, Collegiate School Automated Teaching Project. He is the author of *Sets, Relations and Functions.*

Teaching Machines *Page 335*

RALPH E. ENGEL, Ph.D., is Professor of Turfgrass Science, New Jersey Agricultural Experiment Station, Rutgers University. Dr. Engel has had experience as an adviser on golf-course turf, lawn turf and turf for military grounds and roadsides. He is the author of many articles on the subject.

Turf-Grass Culture *Page 214*

RAYMOND A. ERICSON, formerly Managing Editor of *Musical America*, is now a staff member of the music department of *The New York Times.* Mr. Ericson is a regular contributor to *High Fidelity* Magazine and to various books.

Music in 1960 *Page 314*

A. M. FRASER is Provincial Archivist of Newfoundland and Curator of the Newfoundland Museum. Mr. Fraser was Head of the Department of History and Political Science, Memorial University of Newfoundland, 1928–53; member of Parliament for St. John's East, 1953–57; member of Canadian Delegation to the NATO Inter-Parliamentary Conference in Paris, 1955; and member of the Canadian Delegation to the United Nations General Assembly, New York City, 1957.

The Three-Mile Limit *Page 106*

BLAIR FRASER, journalist, is Editor, *Maclean's* Magazine. Mr. Fraser has been a commentator on CBC since 1944 and has given occasional broadcasts for BBC and ABC. He has contributed articles to *Foreign Affairs.*

The Game of Canadian Politics *Page 35*

FORD CHRISTOPHER FRICK, L.H.D., LL.D., is National Commissioner of Baseball.

What Do You Think Are the Causes and Cures for Slumps in Baseball? *Page 45*

WILLIAM H. GERDTS is Curator of Painting and Sculpture, the Newark Museum, Newark, New Jersey. For some time Mr. Gerdts was Resident Director of the Myers House in Norfolk, Virginia, and was on the staff of the Norfolk Museum. He has contributed articles to various professional publications.

Review of Art in 1960 *Page 290*

MAURICE GHNASSIA is an Associate Editor, Grolier Incorporated. He is United States and United Nations correspondent for the independent Paris weekly *France Observateur.* Mr. Ghnassia is the author of several short stories and two novels. His play, *Spartacus*, was produced and performed in Paris in 1957 by the *Comédie Française.*

The Third Force in the United Nations *Page 134*

JULIUS GOLDMAN, President and General Manager, Revere Airways, Inc., is President, the Kiwanis Club of Revere, Massachusetts; Director of the Revere Chamber of Commerce; President, National Air Taxi Conference, Washington, D. C.; and Vice-President for Transportation, National Aviation Trades Association, Washington, D. C.

Air Taxis *Page 160*

JACK GOULD, Radio-TV Critic, *The New York Times*, has received various awards and is the author of *All about Radio and Television.* He has contributed many articles to magazines.

Pay TV *Page 369*

EDMUND GREKULINSKI is Staff Editor, *The Book of Popular Science;* he was formerly an editorial assistant, American Museum of Natural History, New York City.

Explosives Up-to-Date *Page 182*

CLARENCE W. HACH is Chairman, English Department, Evanston Township High School, Evanston, Illinois. Mr. Hach has contributed to various educational periodicals and is coauthor of *Scholastic Journalism*, a text-workbook, and *English for Today*, a series of texts for high school students.

Team Teaching *Page 332*

JAMES J. HAGGERTY, JR., is Editor, *Aerospace Year Book*. He was formerly *Collier's* military and aviation editor.

The Year in Space *Page 257*

JOHN W. HAZARD is Senior Editor of *Changing Times, The Kiplinger Magazine*, and previously was a reporter for the *Washington Times* and the *Wall Street Journal*. Out of his war experience came the short story "The Flying Teakettle," published in *The New Yorker* magazine and later made into a motion picture, *You're in the Navy Now*, starring Gary Cooper.

Consumer Credit *Page 169*

FRED M. HECHINGER, LL.D., L.H.D., is Education Editor of *The New York Times*. Dr. Hechinger's wide newspaper experience has been largely in the field of education. He has been the recipient of many awards and is the author of several books, among them *An Adventure in Education, Worrying about College* and *The Big Red Schoolhouse*. He is also Education Editor of *Parents' Magazine*.

The American Educational System and Its Critics *Page 328*

BRUCE HUTCHISON, author and journalist, is Editor, *The Victoria Times*, Victoria, B. C. He has contributed stories and articles to magazines and newspapers in the United States and Canada and is the author of several books, among them *The Incredible Canadian* (a biography of Mackenzie King) and *Canada, Tomorrow's Giant*. Mr. Hutchison received the Governor General's Award in 1943, 1952 and 1957.

Canada's Trade Deficit *Page 26*

DOUGLAS HYDE is an author, journalist, lecturer and television commentator. He has traveled in almost all parts of the world and averages about 60,000 miles a year in air travel. Among Mr. Hyde's books are *I Believed* and *One Front across the World*.

New Communist Tactics in Southeast Asia *Page 137*

JOHN E. IVEY, JR., Ph.D., LL.D., sociologist and university administrator, is President, Midwest Council on Airborne Television Instruction, Purdue University. Dr. Ivey has held many high administrative positions and has written many articles for professional journals. He is the author of *Channeling Research into Education* and coauthor of *Building Atlanta's Future, Exploring the South* and *Community Resources*.

MPATI—Experiment in Education *Page 338*

CONCHA ROMERO JAMES is a Reference Specialist, the Hispanic Foundation, the Library of Congress.

Latin America in 1960 *Page 115*

JACOB K. JAVITS, United States Senator from New York, was Congressman from New York in the 80th-83d and 85th Congresses and United States Senator from New York, 1957– . He was formerly Attorney General of the State of New York.

How Do You Feel about Man's Attempt to Conquer Outer Space? *Page 40*

DAVID S. JOHNSON is Chief, Meteorological Satellite Laboratory, United States Weather Bureau. He was formerly research meteorologist at University of California at Los Angeles and the Pineapple Research Institute of Hawaii. Mr. Johnson's principal specialty is meteorological instruments and observations.

Meteorology Enters the Space Age *Page 237*

ALEXANDER JOHNSTON, author and free-lance writer, has contributed many articles to international magazines.

Tsunamis: Terror in the Pacific *Page 229*

ANDREW MARTIN KAMARCK, Ph.D., is Lecturer in African Affairs, School of Advanced International Studies, Johns Hopkins University. He has traveled extensively in Africa in the last ten years and has contributed papers to various scholarly and professional journals and conferences.

Apartheid *Page 120*

ARTHUR KNIGHT is Film Critic, *The Saturday Review*, and Instructor, College of the City of New York Institute of Film Techniques. In 1958 Mr. Knight received the Screen Directors Guild Critics' Award for "outstanding contributions to motion-picture criticism." He has contributed film articles to national magazines and encyclopedias and is the author of *The Liveliest Art*.

The World of Ingmar Bergman *Page 359*

ROSE LAMMEL, Ed.D., is Professor, Science Education, Wayne State University. Dr. Lammel was previously associated with Colorado State College, Ohio State University, Teachers College, Columbia University, and New York University. She is the author of many articles in professional educational publications.

Changes in Science Teaching *Page 341*

WAYNE LAWSON is Staff Editor, *The Book of Knowledge*.

The Beats *Page 97*

WILLIAM LIVINGSTONE is Staff Editor of the *Encyclopedia Americana* and has contributed articles to *Dance Magazine*.

Dance in 1960 *Page 298*

HENRY CABOT LODGE, JR., Litt.D., D.C.L., LL.D., diplomat, was United States Representative, the United Nations, and Representative, the UN Security Council, 1953–60. Mr. Lodge was United States Senator from Massachusetts, 1937–43, was re-elected in 1942 and resigned to go into the United States Army, was re-elected November 5, 1946, for term ending January 1953.

How Do You Feel about Man's Attempt to Conquer Outer Space? Page 40

TANIA LONG has been a correspondent with *The New York Times* since 1941, first in London, then in Paris, Germany and London again. At present she is *The New York Times* Correspondent in Canada.

Canada Boosts Gas Exports Page 188

GORDON E. McCALLUM is Chief, Division of Water Supply and Pollution Control, Public Health Service, United States Department of Health, Education and Welfare. Before joining the Public Health Service, Mr. McCallum served in local and State government. He has contributed numerous articles to professional journals.

Water-Pollution Control Page 226

ROGER H. McDONOUGH, Litt. D., is Director, Division of the State Library, Archives and History, New Jersey Department of Education. He has had long and extensive experience in library administration and has contributed to various professional publications.

Rural Libraries Page 302

LAURENCE J. McGINLEY, S.T.D., L.H.D., LL.D., Ph.D., Litt.D., D.C.L., D.Sc., is President, Fordham University. Dr. McGinley has been the recipient of many awards.

How Do You Feel about Man's Attempt to Conquer Outer Space? Page 40

LANE MANDRY, free-lance journalist, follows theater developments at home and abroad.

On Stage! Page 373

CHARLES PAUL MAY, writer and book reviewer, is the author of *Box Turtle Lives in Armor*, a children's book. Mr. May is Associate Editor, *Encyclopedia Year Book;* Staff Editor, *The Book of Knowledge* and Associate Editor, *The Book of Knowledge Annual.*

Conventions Are Big Game Page 173

MARGARET MEAD, Ph.D., D.Sc., anthropologist and writer, is Associate Curator of Ethnology, American Museum of Natural History. Dr. Mead has been on expeditions to the Admiralty Islands and New Guinea. She was Director of Columbia University Research in Contemporary Cultures, 1948–50, and is now Adjunct Professor of Anthropology at Columbia University. Dr. Mead has written many books, among which are *Coming of Age in Samoa, Growing Up in New Guinea, The Changing Culture of an Indian Tribe* and *New Lives for Old.*

How Do You Feel about Man's Attempt to Conquer Outer Space? Page 40

HELEN HYNSON MERRICK, writer on geography and geopolitics, is Editor in Chief, *Lands and Peoples;* and Associate Editor, *The Book of Knowledge.* Miss Merrick is the author of *You and Your Globe.*

Variations on the Communist Theme Page 127

EARL SCHENCK MIERS, author and publisher, has had wide editorial and writing experience and is a well-known authority and writer on the Civil War. Among his books are the following: *Robert E. Lee, Ball of Fire, The American Story, Rebel's Roost* and *The Great Rebellion.*

The Civil War in Books Page 311

MARY MOTT, writer and lecturer, is a conchologist and has spent many years collecting and exhibiting shells.

Shell Collecting Page 394

CECIL J. NORTH is President of the Metropolitan Life Insurance Company. He has been an officer of the company since 1929 and a member of the board of directors since 1958. Mr. North is a former president and director of the Life Insurance Agency Management Association and serves on important committees functioning in the life-insurance field.

What Do You Weigh? Page 235

BETTY PEPIS, writer and lecturer, is author of *Books in the Home, Guide to Interior Decoration* and *House and Garden's New Complete Guide to Interior Decoration.* Miss Pepis writes a twice-a-week syndicated column—"Interior Decorating"—that appears in some eighty newspapers.

Danish Design for Today Page 294

CLARENCE G. PETERSEN is Assistant TV-Radio Editor of the Chicago *Tribune.*

Review of TV and Radio Page 362

W. T. PIPER, JR., is Executive Vice-President, Piper Aircraft Corporation. He has been associated with the Piper company since his graduation from Harvard College in 1934.

Private Flying Page 162

HOWARD PYLE, LL.D., is President of the National Safety Council. For two terms, beginning in 1951, he was Governor of Arizona. From February 1955 to February 1959, he served as Deputy Assistant to the President of the United States for Federal-State Relations.

Safety on the Highways Page 191

ELLSWORTH RAYMOND, Ph.D., is Associate Professor, Government Department, Washington

Square College, New York University. He was research analyst and chief translator, U. S. Embassy in U.S.S.R., 1938–43, and head of U.S.S.R. economic section, Military Intelligence, U. S. Army, Pentagon, 1944–46. Dr. Raymond is the author of *Soviet Economic Progress.*

How Good Is Soviet Education? *Page 123*

JACK ROOSEVELT (JACKIE) ROBINSON, LL.D., athlete and businessman, was the first Negro to enter major-league baseball. He played with the Dodgers, National League Baseball Club, from 1946–56. Mr. Robinson is Vice-President of Chock Full o' Nuts Company.

What Do You Think Are the Causes and Cures for Slumps in Baseball? *Page 45*

ELEANOR ROOSEVELT (MRS. FRANKLIN D.) L.H.D., writer-lecturer, is famous for her interest in education, social welfare and world affairs; she is active in the American Association for United Nations. Mrs. Roosevelt is the author of many books and articles and the recipient of distinguished awards.

How Do You Feel about Man's Attempt to Conquer Outer Space? *Page 40*

DOROTHY C. ROSAPEPE, free-lance writer, has written numerous articles on American and foreign travel.

Motels Come of Age *Page 194*

JOSEPH S. ROSAPEPE, business and financial writer, has contributed to many magazines and books on business and industry. He was formerly Associated Press World Service Business and Financial News Editor.

Finding the Right Man *Page 179*

ELIZABETH RUBIN, free-lance writer, is the author of *Flying Animals* and *The Curies and Radium.*

Virus Breakthrough *Page 223*

STEPHEN RUDDY is Managing Editor of *The Book of Knowledge Annual.*

The New Diplomacy *Page 131*

NORTON RUSSELL is a free-lance writer and has contributed to numerous periodicals.

The Promise of Thermoplastic Tape *Page 249*

EDWARD R. SAMMIS, writer and editorial consultant, has contributed to numerous periodicals and has held various editorial, newspaper and magazine writing posts. He has been Editor of *The Lamp,* for Standard Oil Company (N. J.); Chief of World Wide Feature Service, Office of War Information; Associate Editor, *Look* magazine; and Chief, Feature Service, CBS. Mr. Sammis was also Editor of the *Handbook of the United States* (OWI) and coauthor of the motion picture and television show *Break to Freedom.*

Desert Oil for France *Page 111*

ARTHUR SCHLESINGER, JR., Litt.D., LL.D., has been Professor of History, Harvard University, since 1954. Dr. Schlesinger has contributed widely to magazines and newspapers and is the author of several books, among which are *The Crisis of the Old Order* and *The Coming of the New Deal.* Among other awards he has received the Pulitzer Prize for History, 1945; Francis Parkman Prize, 1957; and the Bancroft Prize, 1958.

How Do You Feel about Man's Attempt to Conquer Outer Space? *Page 40*

ROWLAND W. SCHMITT, Ph.D., is Manager, Physical Metallurgy Section, General Electric Research Laboratory. He has been working generally in the fields of electronic behavior of metals and alloys, electrical conductivity and superconductivity. He has contributed articles to various technical publications.

The Uses of Extreme Cold *Page 246*

JULIAN SEAMAN, music critic and editor, is Associate Music Editor, Grolier Incorporated. He has been music editor and critic on various newspapers, as well as lecturer, radio commentator and program annotator. Mr. Seaman is the author of *Great Orchestral Music.*

Review of Records, 1960 *Page 318*

ABBA HILLEL SILVER, D.D., Litt.D., D.H.L., H.H.D., is Rabbi of The Temple, Cleveland, Ohio. Dr. Silver has received many awards and is the author of several books, among them *Vision and Victory* and *Where Judaism Differed.*

How Do You Feel about Man's Attempt to Conquer Outer Space? *Page 40*

HENRY S. SIMMS, Ph.D., is Assistant Professor of Biochemistry, Department of Pathology, College of Physicians and Surgeons, Columbia University. Dr. Simms has been doing research on aging and arteriosclerosis since 1932. He has contributed papers to various professional publications.

Studies toward a Longer Life *Page 232*

C. R. SMITH, President, American Airlines, Inc., has played a leading role in the development of both commercial and military air transportation in the United States. As Chief of Staff and then as Deputy Commander of the Air Transport Command during World War II, he was instrumental in building the global air-transport system of the armed forces. He continues to be an influential adviser to the Government and the aviation industry on transportation matters.

Faster Air Travel—on the Ground *Page 164*

HOWARD K. SMITH, LL.D., is CBS News Washington Correspondent. In 1941 he joined CBS News as Berlin Correspondent (Switzerland) and in 1946 became CBS News Chief European Correspondent, in London, a post he held from

1946–59. Mr. Smith has received various awards for newspaper writing and reporting and is the author of the 1942 best seller *Last Train from Berlin* and *The State of Europe.*

The Communist Posture, Summer 1960 — *Page 31*

EDOUARD A. STACKPOLE is Curator, The Marine Historical Association. Mystic Seaport, Connecticut. Mr. Stackpole was President of the Nantucket, Massachusetts, Historical Association, 1938–51, and Curator of the Whaling Museum of Nantucket. He is the author of *The Sea-Hunters, Dead Man's Gold, Smugglers' Luck, Madagascar Jack* and other books.

Mystic Seaport—Living Museum of the Sea — *Page 304*

DR. FRANCES STONE is Economic Consultant for American-Marietta Company.

The United States: The Prospect Ahead — *Page 102*

WILLIAM H. STRINGER has been with *The Christian Science Monitor* since 1935 and is now Chief, Washington News Bureau. Mr. Stringer has served in news posts including London, Paris and Cairo, and was Chief of the *Monitor's* London Bureau, 1947–51. He is the author of the front-page column "The State of the Nations" and of *Summit Roundup: Profiles of 21 World Leaders.*

The Road to Civil Rights — *Page 88*

C. L. SULZBERGER is foreign-affairs columnist for *The New York Times* and was that newspaper's chief foreign correspondent from 1944 to 1954.

The Experts We Need — *Page 24*

LOWELL THOMAS, Litt.D., LL.D., L.H.D., Dr. of Humanities, is well known as an author, lecturer and commentator. He has written many books and traveled widely.

The U-2 Incident — *Page 28*

ROBERT TROUT, CBS News Correspondent, has been a radio and television news broadcaster since 1931. He has covered many of the world's elections, presidential inaugurations and the coronations of King George VI and Queen Elizabeth II. Mr. Trout has written articles for many national publications.

Highlights of the Year — *Page 16*

GARRETT UNDERHILL, recognized expert on military matters and authority on the armed forces of the Soviet Union, was staff military reporter for *Life* for ten years and has contributed to various magazines. Mr. Underhill served during both World War II and the Korean war as an intelligence specialist on the General Staff of the Department of the Army (War Department in World War II).

Mr. Khrushchev's Economic War — *Page 141*
The Missile Gap — *Page 263*

ROBERT VERMILLION is Correspondent, the Washington Bureau, *Newsweek*. Mr. Vermillion was with United Press for twenty years in the United States, Europe and Asia. In 1954 he started a daily newspaper, the *Morning Star*, on Okinawa. In the spring of 1958 he joined the staff of *Newsweek*.

The Electoral College — *Page 100*

ELIZABETH VON ESCHTRUTH-WERNER is a free-lance writer who often writes on scientific subjects.

Lise Meitner — *Page 268*

MOIRA WALSH is the Film Critic of *America, National Catholic Weekly Review.*

The Film Year in Review — *Page 354*

WIRT WILLIAMS, Ph.D., is Associate Professor of English at Los Angeles State College and Sunday Book Editor of the *Los Angeles Times.* He is a two-time nominee for the Pulitzer Prize in fiction and his third novel, *Ada Dallas*, is being filmed by Metro-Goldwyn-Mayer.

The Bookshelf of 1960 — *Page 307*

JOE WILMAN is a member of the Brunswick Advisory Staff of Bowling Champions. He was National All-Star Tournament champion, 1946; ABC Tournament all-events champion, 1939 and 1946; and National Doubles cochampion, 1946 and 1953. He was elected to the American Bowling Congress Hall of Fame in 1951 and was named Bowler of the Year for the 1946-47 season. He is the author of *Better Bowling, Your Bowling Handbook* and the syndicated daily newspaper column "Better Bowling."

Big Boom in Bowling — *Page 399*

R. M. YOUNGER is a free-lance writer who writes many articles on various aspects of Australian life.

Australia—Business Frontier — *Page 108*

COMMENT and OPINION

THE YEAR EVALUATED

Highlights of the Year
Robert Trout 16

WHAT THEY SAID WHEN IT HAPPENED

The Experts We Need
C. L. Sulzberger 24
Canada's Trade Deficit
Bruce Hutchison 26
The U-2 Incident
Lowell Thomas 28
The Communist Posture, Summer 1960
Howard K. Smith 31
The Game of Canadian Politics
Blair Fraser 35
End-of-the-Year Cartoons 38

THE ENCYCLOPEDIA YEAR BOOK ASKS

How Do You Feel about Man's Attempt to Conquer Outer Space? 40
What Is the Cause of Slumps in Baseball? 45

HIGHLIGHTS OF THE YEAR

By ROBERT TROUT

News Correspondent, CBS

NOT even the most persistent seeker after silver linings or the habitual viewer of the sunny side could claim that 1960 was a year of general merriment, high spirits and cheery comradeship among men. In their Christmas messages at year's end, the Archbishop of Canterbury said, "This has been a sad year"; the Pope spoke of the "storms, ever more grave, that rage over some parts of the world"; Queen Elizabeth said that by no stretch of the imagination could 1960 be called happy or successful; and President Eisenhower revealed that he discerned an apathy toward standards of integrity.

None of these personages, or others who publicly assessed the shocks and strains of a dozen months, expressed special anxiety over the earth's next round trip; all said they are hopeful of the future. It is 1960 that is given the black mark.

Yet, by mid-century standards, 1960 began agreeably enough. All the principal nations seemed to be preparing to bask, with varying degrees of caution, in what both experts and laymen took to be a thaw in the cold war. Following the visit of Premier Khrushchev to the United States, President Eisenhower's calendar called for a trip to the Soviet Union when the weather turned warm. The summit meeting of Big Four leaders, so resolutely pursued during the previous year by British Prime Minister Macmillan in particular, was at last on the schedule, listed for Paris in May, a month when, despite certain versifiers, Paris is lovelier than in April. In the first week of the year, Senator John F. Kennedy, of Massachusetts, announced that he was a presidential candidate, and fanciers of politics looked forward pleasurably to a contentious Democratic convention to balance the expected mild convention of the Republican Party, which in advance had virtually chosen Vice-President Richard M. Nixon as its candidate. On New Year's Day, Frenchmen began to use their new franc, worth a hundred of the old ones and, while almost no one could say that he had been rendered more prosperous by the shift, almost every one felt a bit more financially secure. American steel mills were creating their product more copiously than ever before and the country's economy was soaring in one of those booms that nobody likes to think is the predecessor of a bust.

By the year's end, unemployment in the steel towns had become a serious problem. The economy was drooping in what would years ago have been called a depression but now is known as an adjustment because recession is considered too discouraging a word. The Russians had announced that their new ruble, worth ten of the old ones, was being distributed to distant corners of the Soviet Union by helicopter and dog sled where

necessary, and the flow of gold out of the United States had alarmed financiers and statesmen throughout the Allied world. Because the Soviet Union was not pressed by the same reasons that impelled France to make the change in francs, Western experts can only guess at the motive that hatched the new ruble. A prime suspicion is that the Kremlin altered its money as a response to the American difficulties with gold, the Soviet Union now able to claim, although not necessarily veraciously, that the ruble is a sound currency, worth more than the dollar.

Even in so noncontroversial a field as civilian aviation, 1960 was not an admirable year. January was scarcely a week old when an airliner fell to pieces over North Carolina. After evidence of a cabin explosion had been found, scores of persons were moved to plague the world's airlines with false warnings of bombs on planes. History's worst plane disaster, the mid-air collision of two passenger planes in the fog over New York City in December, had been preceded by the collision in the fog of two passenger planes over Rio de Janeiro Bay in February. Each collision had been followed, a day later, by a dreadful passenger-plane crash, one in Ireland, the other in a busy Munich street.

Air travelers and earth-bound citizens alike learned, in the arguments and revelations after 134 persons had died in the New York collision, that the system of regulating air traffic had not kept pace with the development of huge and speedy aircraft. There were new calls for better traffic controls near airports and demands that the airports be moved farther from large cities. But in an age that constantly insists on more speed the prospect was for congestion in the air to increase even more rapidly than automobile overcrowding on the ground.

It was a single-seat airplane, which crashed outside the city of Sverdlovsk, population roughly three quarters of a million, in Russia's Ural Mountains, that put the frost back into the cold war. It demonstrated again that a thaw in the frigid relations between the totalitarian countries and the democracies is not the

A French Government poster explains the new franc as applied to the cost of various items.

AGENCE FRANCE PRESSE

An idle coal miner and empty coal cars, symbols of severely depressed pockets in the United States.

WIDE WORLD

IBM

The IBM 7080 data-processing system was announced in 1960 as one of the most powerful computers for processing commercial data. In one second it can "read" or "write" 312,500 characters of information or make 303,000 logical decisions or add or subtract 78,000 six-digit numbers or multiply 7,100 six-digit numbers.

beginning of friendship but only a change in the rules of the conflict.

From the moment of the first Russian announcement that the U-2 research plane had been shot down, it was clear that the men who rule the Soviet Union believed that they had found a propaganda weapon that would give them far greater gains than a meeting of the four heads of government at the Paris summit. Their noisy destruction of that meeting on the scene in Paris, spectacular as they made it, was, like the later theatrical exhibition and sentencing of the pilot in Moscow, merely another exercise in the use of that propaganda weapon. The United States blunder in acknowledging and seeking to justify the deliberate use of the plane to gather military information strengthened the weapon that the Russian leaders had already grasped. It did not actually hand the weapon to the Russians; there was no need of that. But the statements from Washington served to nurture whatever seeds of doubt may have originally been planted by Moscow in the minds of neutrals when Soviet military planes on numerous earlier occasions fired at United States aircraft that were not violating anybody's airspace. And the statements made easier for the Russians such a subsequent act of violence as their shooting down of the United States RB-47 plane while it was mapping magnetic fields over international Arctic waters in July, part of a long-term peaceful scientific undertaking that has never been concealed from the officials of the Soviet Union.

However great or small the Soviet lead over the United States in missile manufacture may be, there is no doubt that the Russians during the year maintained and brilliantly demonstrated their clear superiority over the free world in the use of propaganda, one of the chief arms with which the cold war is fought.

Last year's record in the exploration of space, a field in which both the great missile and rocket powers promised greater results for 1960 than they were able to deliver, showed more clearly than before that the Soviet Union appears to emphasize space propaganda victories over either pure science or technological advances. Russia's far more powerful rocket engines still give the Soviet Union the capability of spectacular space feats that seize the world's imagination. The Russian space program, as it has continued to be revealed this past year, seems to be aimed primarily at such seizures, timed when possible for the greatest effect. By contrast, United States scientists, working with smaller but more intricate space instruments, went ahead with their construction of a basis for the systematic exploration of space. They were trying to give their country not only the world's best space science but also the practical benefits, peaceful and military, that may spring from this science. Among these are expected to be satellites and spacecraft to map the earth with more precision than has so far been done, make long-range weather predictions, aid navigation, improve earth communications, warn of the presence of enemy missiles, seek out military preparations and potential strategic targets in foreign countries and soar into space with supplies for other craft that are already in orbit.

None of these bizarre machines could be built and launched without the services of a family of machines even more ingenious, the self-regulating devices that are known by such names as thinking machines, electronic brains, and computers. They are transforming society in the revolution of automation which may, a century or so from now, be judged more significant in the world's history than such an old-fashioned overturn as the Bolsheviks managed in 1917.

At a UNESCO conference in Paris, the people who build and care for electronic brains were told that today's computers, a million times faster than their grandfathers were ten years ago and a thousand times faster than their fathers were three years ago, will soon be sent to the equivalent of the Old Machines' Home when their sons, now being created, appear on the scene. And it was pointed out that, contrary to popular belief, computers are capable of what amounts to original thinking and emotional reaction. Because of their speed, after making their own decisions, they could take invidious actions long before their slow-thinking human keepers realized that the revolt of the machines, often humorously foretold, had actually broken out.

Cheerfully indifferent to the threat of machine dictatorship, large sections of mankind in 1960 occupied themselves at intervals with such non-electronic, unmechanical affairs as Elizabeth Taylor's mysterious illness which turned out to be a toothache that became big business by interrupting production of a motion picture at a possible cost of some millions; the romantic tribulations of Brigitte Bardot, which threatened to affect the draft program of the French Army and, last year, included an unsuccessful attempt at suicide; and the announcement of impending divorce by Marilyn Monroe, which brought a denunciation of the actress by the government-owned news agency in the Soviet Union where the plays of her third husband, Arthur Miller, are, as Willy Loman would have said, "well liked."

The Shah of Iran and his third wife who, as the year began, were on the honeymoon that they had had to delay because of troop movements in neighboring Iraq, in October became the parents of the Shah's first son and long-awaited heir to the Peacock Throne, which it is the policy of the Soviet Government to destroy. The pleasure of the Iranian populace at the birth suggested that the Russians' cold offensive has not been so successful as they might have hoped.

King Baudouin of the Belgians and his bride, Queen Fabiola, as the year ended were forced to curtail their honeymoon and return to Brussels where the Government was endangered by the strikes protesting a proposed reduction of welfare services following the collapse in the Congo. Their December wedding had been seen as it was happening by television viewers in the British Isles and on the Continent, linked by the Eurovision system, but was ignored by United States television.

Not so the May wedding of Princess Margaret and photographer Antony Armstrong-Jones. Not only were Eurovision viewers shown the Westminster Abbey wedding while it was being performed but the films of the ceremony and the procession to Buckingham Palace, hastily flown across the Atlantic, became the year's one major television program in the United States to win universal praise.

The year's television innovation that was accorded the best chance of being repeated in future years, with certain changes in cast and script, was the series of joint question-and-answer periods of the two presidential candidates, Senator John Kennedy and Vice-President Richard Nixon.

Among the moving-picture successes of the year in America, one of the freshest in subject matter was the English film that had pleased audiences at home the year before, *I'm All Right, Jack.* This made organized labor the butt of the joke while circumspectly throwing a handful of darts at employers too. In this film, Peter Sellers clinched his position at the top of the list of Britain's versatile film comedians, succeeding versatile Sir Alec Guinness who has recently confined himself to serious roles. Sir Alec's major achievement of the year was his typically subtle interpretation, on the London stage, of the complex character who was plainly intended to be the late Lawrence of Arabia, in Terence Rattigan's play *Ross*.

The New York stage, darkened in late spring by the first actors' strike in more than forty years, in late autumn opened *Camelot*, the most intensely heralded musical play of all time. But all that the Broadway critics found to praise were the sets and costumes, conceded to be the most dazzling ever seen on a stage, although doubtless no more admirable than their originals in the simpler England of years ago.

Near the close of the year, a comic film that crept quietly across the ocean from Italy set laughing New York audiences to talking about the good old silent days of sight gags and grimacing pantomimists. This was true even though *The Big Deal on Madonna Street* is a modern talking-movie with English subtitles, a kind of distorted Italian *Rififi*, featuring a gang of criminals who are constitutionally unable to do anything right.

Italians took a big role in another entertainment, too, if entertainment is the right word for international amateur tennis. Their team eliminated the United States, to play the Australians, who kept the Davis Cup with their ninth victory in eleven years. The year was an Olympics one, and no one was surprised that the Russian athletes gained the greatest number of points as well as the largest number of gold medals. No one was surprised, either, that these national scores were carefully watched and reported with the customary quadrennial disregard for the ideal of the founders of the modern games, who wanted to produce individual contests between athletes from various countries instead of providing still another arena for the clash of the pride and rivalries of nations.

Almost the only international combat in which the United States, while a participant, was not pitted against the Soviet Union was the boxing match in which Floyd Patterson became the first former heavyweight champion to regain the title, when he knocked Ingemar Johansson unconscious. Of almost equal interest was the blow that Patterson's fifth-round left hook dealt to the tempting theory that the necessity for harsh training is out of date, supplanted by the Johansson system of strength through joy, sometimes known as building muscular power and speed through relaxation.

The acrimonious and potentially catastrophic contest between the United States and the Soviet Union was, of course, the prime reason for the poor rating given to 1960 by a world already confounded by dilemmas on every side. One formidable problem was the relations between employers and those employed, which plainly demanded new thinking in an industrial age that had progressed from simple steam to the complexity of electronics. In one country alone, the United States, the business slump of the final quarter was blamed by some, in part, on the strike that shut down most of the steel industry a year earlier. Yet a rational approach to the desirable goal of eliminating strikes in democratic nations remained, as did the solutions of so many predicaments, clouded by the emotional world argument of capitalism ("citizens must be free to choose their own course of action even if harmful") versus communism ("strikes are not allowed because the employer is the state and the state is the people").

The relations between people of different races formed another phase of the contest. Africans afflicted with antiwhite prejudices matched Europeans with an antiblack bias. The Soviet Union went on deflecting African and Asian attention from the fact that Russians are white, and did it with considerable success despite such anomalies as the official Soviet denunciation of jazz music, that towering creation of men with dark skins, as degenerate. In the United States, Americans demonstrated no progress in illuminating the obscure frontier between giving all citizens equal rights and giving all citizens equal affection. As the school desegregation conflict moved to New Orleans—to the grief of all who cherished that city's renown for carefree grace, a reputation it did not share with Little Rock—the right of Negro children to attend the same schools as white children was still being resisted by white parents. Their basic fear was not the right of identical education but the privilege of social mixing that could lead to marriage, the ultimate social fusion. The most notable American campaign last year for equal rights was the successful "sit-in" drive that forced chain stores, which serve Negroes in their other departments, to serve them also at their lunch counters. Nowhere in the United States was there racial violence to compare with the bloody Sharpeville riot in South Africa or the now perpetual skirmishes and outbreaks in the former Belgian Congo.

Above all, the cold war was fought on the confused field of nationalism, which during 1960 rang with the usually misleading war cries of "Independence!", "Colonialism!" and "Imperialism!" With great reason, the Soviet Government has acted on the belief that all underdeveloped colonies that are detached from European empires enter a period of partial independence that is strictly transitory and ends sooner or later with their being taken into the communist empire. Allowing the issues of West Berlin and disarmament—an area in which the Soviet Union may sincerely wish to make some progress—merely to smolder, the Soviet Government concentrated its agitation on the territories that have or had ties with Europe, from Laos to the Congo, from Algeria to Cuba.

Charles de Gaulle's attempt to solve the apparently unsolvable crisis of Algeria gave the world last year its one view of a government leader acting with authentic greatness, so thoroughly genuine that his most determined enemies wasted no time in attempting to deny the grandeur of his performance. The plight of Cuba could be summed up in the melancholy fact that more Cuban refugees have entered the United States than refugees who came here from Hungary. Both Laos and the Congo threatened, during the closing days of the Eisenhower Administration, to become battlefields of a shooting war in the style of the Korean action.

The Soviet offensive aimed at the former European colonies was waged with such vehemence—including Khrushchev's personal shoe-pounding—in the forum of the United Nations that that world organization, which showed its first real signs of distress in the Middle East crisis which the Egyptians began with their seizure of the Suez Canal four years before, started to wobble like a toy top that has almost run down. Its entrance into a period of critical adversity in the middle of its second decade of life roughly paralleled the experience of the League of Nations before the second World War. Least concern of any members at the possibility of the collapse of the United Nations was shown by those who seemed in danger of becoming the biggest losers, the new African countries whose admission to membership had aggravated if not created the organization's emergency. Each of these relatively primitive states has the same vote as each mature nation of western Europe, or Great Britain or the United States, al-

Methodist pastor Andrew Foreman escorts his little daughter to a New Orleans desegregated school.

though not quite the same as the Soviet Union which refused to join until given a larger vote than anyone else.

The continued communist assault on the community of the North Atlantic alliance nations and their friends was one of the major topics of the prolonged November conference of leaders of communist states in Moscow. Reportedly, the conference decided to concentrate communism's greatest efforts on the economically troubled nations of South and Central America, with the Chinese taking the lead in the Latin American penetration. The Soviet Union took pains to publicize the Russian assertions that Communist China has agreed to the Kremlin program of continued cold-war offensive short of major armed conflict, but it was clear to all that the Chinese had won new stature and that the communist giant now has two heads.

That Moscow and Peking should have their differences is so natural a fact of life that even some of the satellite representatives who had attended the November meeting did not afterward bother to deny it. And through the year, reliable news correspondents often reported Russian-Chinese competition to win friends and influence people in Asian borderlands like North Vietnam. But that contest, unlike the survival conflict between communist countries and democracies, was of the type that the psychiatrists call sibling rivalry, a squabble within a family that maintained a solid, hostile front to outsiders.

The steady emergence of Communist China as one of the world's superpowers overshadowed even so momentous a development as the power struggle in Africa, heightened by the withdrawal of much of Europe's influence in that continent. In a year in which scientists predicted an important hastening of the pace of scientific discovery and technological advance in the next few years, the Chinese, starting from far behind, were considered the most likely to make the greatest strides. In a year in which the French exploded three nuclear devices and Israel was disclosed to be erecting a nuclear reactor in the desert, dismayed nuclear physicists predicted that the Chinese would be the first nation outside the present "nuclear club" to build a bomb of their own.

The beginning of the year found the heads of government of most of the principal powers preparing for a series of international tours more extensive than any in history. None, however, was so startling as the quietly planned visit to Pope John XXIII in the Vatican by Dr. Geoffrey Fisher, the archbishop of Canterbury. The unprecedented meeting of the two spiritual leaders symbolized the urge toward unity that the perilous times have forced on Christians. Many felt that,

UPI

John Fitzgerald Kennedy, Jr., 1960's celebrated American baby, makes his first public appearance, at his christening with his parents. Thus 1961 began with both a new administration and a new baby in the White House.

although little definite progress had been made, the year had brought closer a union of Protestantism's branches as well as a reconciling of churches of Protestant, Roman Catholic, and Orthodox.

Premier Khrushchev, President de Gaulle, Prime Minister Macmillan, Chancellor Adenauer, President Eisenhower all had meant to move fast and often during 1960. By the middle of 1960, President Eisenhower's visit to Japan had been canceled because of the anti-American street rioting in Tokyo. Except for a brief stop on the Mexican border in the autumn, Mr. Eisenhower was finished with presidential traveling to other countries. By the end of the year all the government heads were at home, with no announced plans for future trips except for proposed Washington visits by the British Prime Minister and the German Chancellor to meet President Kennedy.

In an era characterized by swift communication and transportation, it seems a pity that the men who control the great governments visit each other only when induced to do so by the pressure of the cold war. Even the first circumnavigation of the globe by a submerged vessel, an achievement that possibly could have important commercial significance, was conducted primarily as a cold-war maneuver by the nuclear submarine USS Triton. She made the voyage, sailing southeastwards from New London, Connecticut, in eighty-four days. A stay-at-home policy appears indicated for John Kennedy by the man he has selected to be secretary of state, Dean Rusk, who earlier this year wrote disparagingly of the theory and practice of summit meetings of government heads. Months before the United States election, he recommended that the secretary of state should be able to act for the president in the field of foreign affairs with the president's confidence.

Mr. Kennedy's November victory at the polls was won by less than 115,000 popular votes, so close that a number of congressmen and columnists raised the loudest cry in years for the overhauling, one way or another, of the nation's creaking election machine. By far the favorite target of the reformers was the institution of the electoral college, but few political observers thought that the college actually faces the danger of imminent decease.

No other major nation voted in a new government in 1960, although there were violent overturns in Korea and Turkey, preceded in both countries by demonstrations in the streets. Japanese street mobs forced out a premier but not his political party, and the Premier's successor led their party to victory in the election that followed. The bulk of the demonstrators in these countries, although led by experienced adults, were young men and women who insisted that their "romping" represented a true expression of democracy. To the demonstrators who were trying to bring down the Government in Belgium in the last days of the year, the Belgian Prime Minister said that when a nation is governed by street demonstrations, democracy is at an end.

It was a year of natural disasters—the immense earthquakes in Morocco and Chile and possible massive farmland calamities in China. It was a year in which scores of thousands who had never seen him passionately debated the death of one man—Caryl Chessman; a year of a ship tragedy—the burning of the unfinished aircraft carrier Constellation, the worst naval mishap in New York Harbor since the liner Normandie burned and capsized in her dock during the second World War; a year in which changing social standards were sharply reflected by the court decision declaring the thirty-two-year-old novel *Lady Chatterley's Lover* now to be fit for sale in Britain.

It was a year that began with higher expectations than usual because by many it was regarded as the start of a decade. Yet it is only because man finds it convenient to reckon by tens that a year that ends in a zero is considered to be of special import, a precursor that ushers in a procession of nine following years. And, also by man's reckoning, the first day of every January provides the planet with a fresh chance. Most of its inhabitants would surely agree that it can use one.

THE EXPERTS WE NEED

By C. L. SULZBERGER

THE NEW YORK TIMES

Paris, January 2

IF the forties of this century may be labeled the Atomic Decade and the fifties that of Lunik, one might venture on the birthday of the sixties to call this the Decade of the Experts. For in the blinding light of our scientific revolution the straight way is lost. Only the expert can pretend to discern where we are headed.

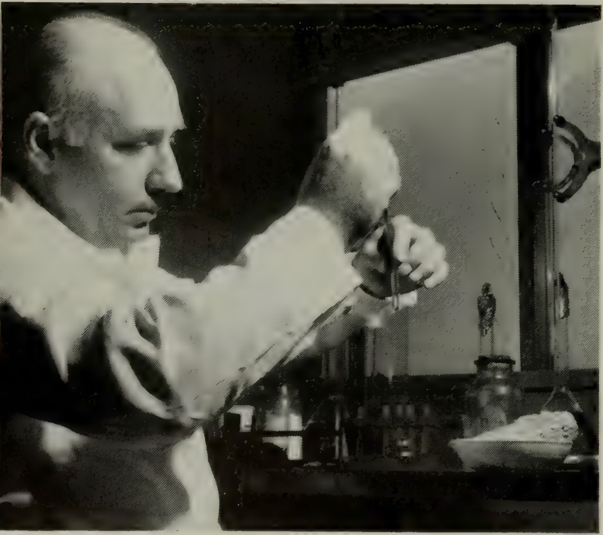
During another age of radical advance in knowledge, the Renaissance, there were also experts: geographers, astronomers, mathematicians and political scientists. But the knowledge they uncovered was relatively understandable to their contemporaries. A sizable body of well-informed men grasped the new learning. Consequently the Renaissance expert was often a jack-of-all-trades, a Michelangelo or Leonardo, whose talents were not confined to any single field.

Old Churchill is perhaps the last Renaissance figure with his gloriously mixed competence as painter, adventurer, statesman and historian. It is doubtful that the sixties can produce its own version of so well-rounded a man, comprehending both atomic science and its political meaning, art and a way of life dependent on machines.

We shall see emerging during the next ten years experts of all categories. There remains the familiar political expert who in former times was more correctly termed soothsayer. In our own country he is already compounding predictions on who will be selected next to head our administration.

His colleagues abroad will have a harder time. Who and what form of government, they must advise us, will succeed the aging De Gaulle in France or the even more elderly Adenauer in Germany before this decade ends? In Russia what system, which man, will take over from ebullient Khrushchev? Will China erupt in internal combustion or overrun all Asia? Can India survive in unity the death of Nehru? Is another Arab-Israeli war inevitable?

ELWOOD BAKER. MONKMEYER



The decade of the expert is here. The biochemist, at the left, requires special skills for his work—testing food for impurities. And the expert, as in the photograph below, can be found everywhere, even in the far north. The United States Public Health Service sends highly trained dentists to the Eskimos.

U. S. COAST GUARD OFFICIAL PHOTOGRAPH

But whether these political experts succeed or fail in doubtful prognostication, still based on the crystal ball, the world's fate scarcely relies upon them. Different experts will fashion the pattern of the sixties. These are the doctors adding to mankind's longevity, or agronomists finding means to feed a consequently swelling population. They are hydroponists who farm the sea, hygienists who purify the land, bathyspherists who probe the oceans, and astronomers who grope beyond the distant Milky Way.

Above all they are the nuclear physicists who now make it possible for man to penetrate to other worlds and who also make it possible for those of us who are not experts to destroy this world before anyone escapes. It is to these experts that the next decade must look in hope and trepidation.

In their abstruse field one finds the greatest absence of a bridge between expert knowledge and comprehension of it even by intelligent nonexperts. How can the experts' facts and extrapolations be conveyed in understandable terms to statesmen, generals or ordinary mortals when even scientists still disagree among themselves on what their knowledge implies?

Words connect meaning with ideas. Medieval alchemists had the wit to perceive this and deliberately chose murky language to obscure their lack of accomplishment. Many modern experts still use turgid vocabularies which only they can fathom. And the superexperts whose experiments will shape our destiny can only explain themselves in formulas. They have no language. They remain the silent men.

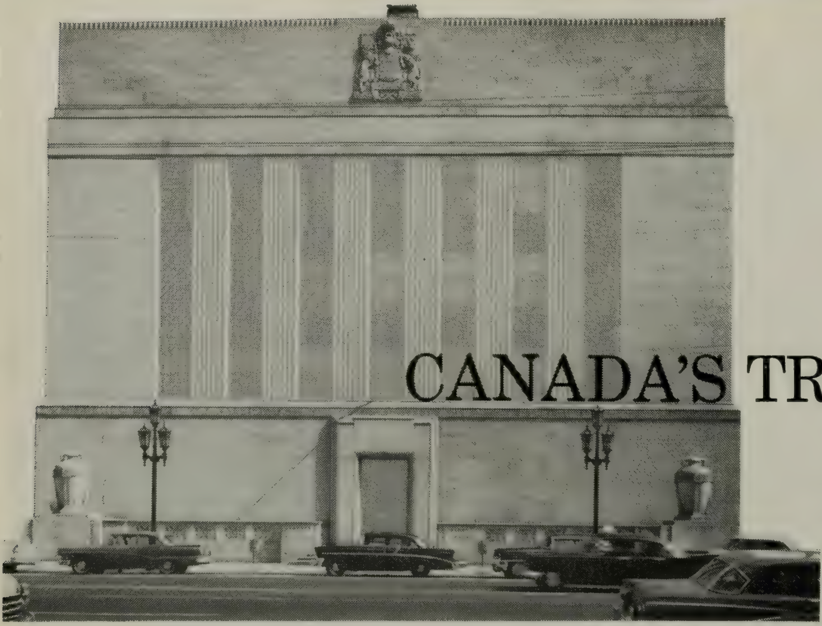
Confucius, the great sage, when a guest in the State of Wei, was asked what he would do if requested to head the government. He replied: "Evidently as a first step, I would see to it that things are called by their right names." This is what we of the sixties require. We need experts in semantics who can understand other experts and convey this knowledge to their fellows. For a mass of ignoramuses is growing up, ignorant of the forces that could consume us.

We may hope this decade can discover ways of eliminating the dangerous hiatus. Science has advanced dizzily while such things as political administration, education or ethics drag. The striking contrast, if charted on a graph, would resemble the graph of an explosion. We must set ourselves to amending this image of explosion if we are to avoid its physical reality.

SCRIPPS INSTITUTION OF OCEANOGRAPHY

On the high seas, the expert oceanographer, at the left, uses the tools of his trade to collect samples of ocean water, from various depths, for analysis. In agricultural regions, the agronomist uses his special knowledge of contour plowing and strip farming to design productive farms, such as those below.

SOIL CONSERVATION SERVICE



CANADA'S TRADE DEFICIT

The Bank of Canada.

NATIONAL FILM BOARD OF CANADA

By BRUCE HUTCHISON

Special Correspondent
THE CHRISTIAN SCIENCE MONITOR

March 16, 1960—Victoria, B. C.

ALTHOUGH warned by the Bank of Canada that they have long been living far beyond their means, most Canadians were surprised by the latest figures showing the nation's huge deficits in international business.

Last year, says the Dominion Bureau of Statistics, these deficits reached the record sum of $1,460,000,000. On a basis of comparative population, that figure would be roughly equal to a deficit ten times as large in the United States.

Canada covered its shortage in foreign exchange by importing foreign capital, most of it from the United States, and thereby piling up foreign debt. The nation's net indebtedness to foreign lenders rose last year to $15,400,000,000 from the 1958 figure of $13,500,000,000.

The largest part of the increase in Canada's 1959 total deficit occurred in commodity trade. The nation sold $386,000,000 worth of goods less than it bought in the world market as against $170,000,000 in the previous year.

But the largest part of the total deficit was in nonmerchandise transactions, including interest payments on foreign loans, dividends on foreign-owned equities, tourist travel and freight costs. In these "invisible" items Canada went behind last year by about $1,000,000,000 as against $915,000,000 in 1958.

What mainly concerns the Bank of Canada is the cost of servicing the foreign debt, both governmental and private.

James Coyne, the bank's governor, does not object to foreign investment in constructive enterprise, but he says much of Canada's borrowings in recent years have been used either for desirable but not revenue-producing projects or for the purchase of consumer goods.

By excessive borrowing abroad on all accounts, he says, the nation has been trying to build and consume too much too fast.

For the present, the interest and principal of Canadian borrowings in the United States and elsewhere can be paid in premium Canadian dollars. But the dollar is held at a premium solely by an import of foreign money, since the deficit in foreign exchange would otherwise drive the Canadian dollar at least to par with the American or lower.

Any serious reduction in capital imports would certainly reduce the Canadian dollar's international price and lead to three results: first, sharp encouragement to Canadian exports, now compelled to hurdle the fence of the dollar's premium; second, discouragement to imports, now stimulated by the premium; and, third, new difficulties for Canadian borrowers.

These potential difficulties are particularly disturbing to the Bank of Canada. For the provincial and municipal governments, as well as private corporations, have borrowed heavily in the United States and must repay in United States dollars.

If United States currency were to become considerably more valuable than Canadian, such borrowers would have to pay more than 100 Canadian cents on every dollar of their debt charges. A Canadian dollar substantially below the American would cause grave problems for some borrowers, especially provinces and municipalities.

The central bank's grave concern about foreign debt, its growth and the possibly increased cost of servicing it in less valuable Canadian dollars is not entirely shared by the Department of Trade and Commerce.

Its minister, Gordon Churchill, said in a recent speech that the growing Canadian economy seemed well able to support these burdens when foreign debt, as a percentage of the gross national product, is smaller than it used to be.

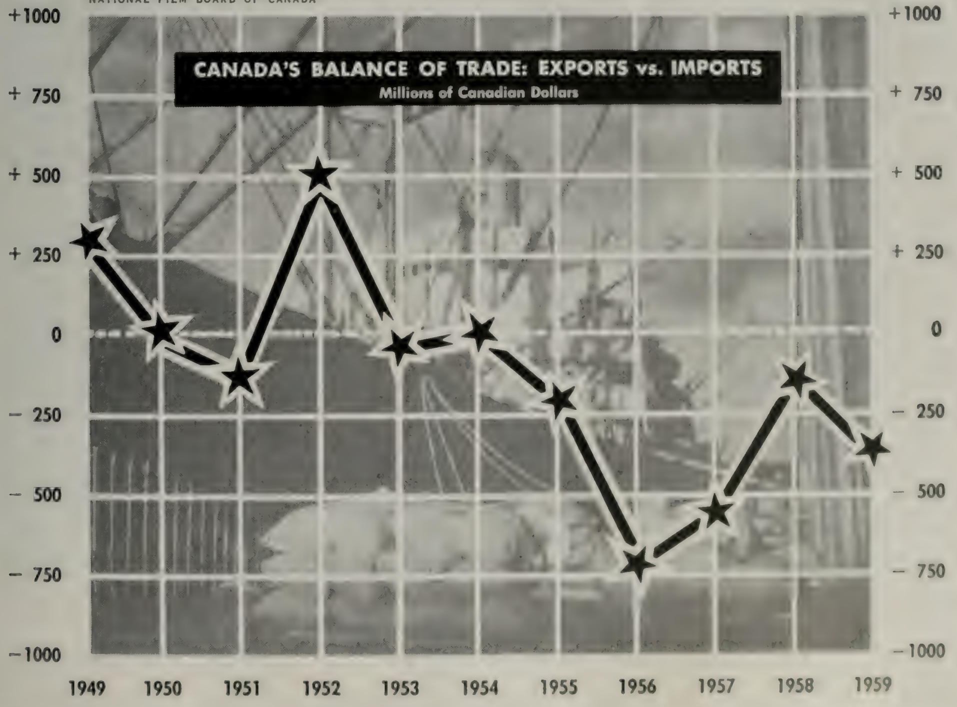
This reasoning does not appear to have impressed the bank, which is owned by the Government but operates independently. The bank still maintains that Canada has been living far beyond its means, should raise more of its investment capital by the increased savings of its own people and should borrow less from foreigners.

The latest figures on the trade deficit underlined the bank's repeated warnings, but Mr. Churchill says they are not as bad as they look. The deficit, he says, has begun to shrink in recent months. During the last quarter of 1959, exports, he notes, were up 17 per cent over the 1958 figure and imports only 5 per cent.

This year's total deficit may be smaller than that of last year but it probably will be large by previous experience, large enough anyway to worry the bank.

Each star on the heavy line indicates the adjusted balance of trade at the end of a given year. A plus balance shows the amount, in millions of Canadian dollars, by which exports exceeded imports, while a minus balance shows the amount by which imports were greater. A plus balance is considered desirable.

NATIONAL FILM BOARD OF CANADA



WHAT THEY SAID WHEN IT HAPPENED

The U-2 Incident

WIDE WORLD

By LOWELL THOMAS

Author and Commentator, CBS

May 5, 1960

PRESIDENT Eisenhower has ordered a complete investigation in the latest East-West uproar. Khrushchev declared today that Soviet fighter planes on May 1 shot down an American jet flying over Russian territory. The United States Ambassador in Moscow was given instructions to inquire of the Soviet authorities for details of this incident, especially the fate of the pilot.

There seems little doubt that Khrushchev was referring to a one-man weather observation jet reported missing in Turkey, near the Russian frontier. The plane was flown by a civilian pilot. When last heard from the pilot reported that at 50,000 feet he was having trouble with his oxygen equipment. This raised the supposition that, for lack of oxygen, he blacked out—his speedy jet with automatic control flying across the border into Russia.

The startling part of it all was the violence with which Khrushchev spoke today in an address before the Supreme Soviet in Moscow, suggesting American aggression to thwart the prospect of the forthcoming summit conference. Khrushchev shouted that there is now little hope for the success of the meeting of the chiefs of state. One peculiar thing was the way he spoke of President Eisenhower, absolving the President of blame, hinting that the incident was the doing of people who want the summit conference to fail. He thought the weather observation jet was "sent by the Pentagon, without the President's knowledge." Obviously, he was casting the innuendo that the President is not in full control of our defense command.

Khrushchev's emotional histrionics today startled the diplomatic world. He did some noisy missile rattling, not at all in the spirit of the summit. One immediate supposition is that he wants to put the West on the defensive as the summit approaches and also to set up an alibi to blame the United States if the top-level meeting fails.

Diplomatic officials in Washington think that the bumptious Khrushchev behavior today may be connected with domestic affairs in Russia. The indications are that there's a cooling off between the masses of the people and the Communist Party, the Russians not paying so much attention to official communist propaganda. The noisy announcement of an American plane violating Russian territory may have been intended to stir people up.

This is also regarded as an angle: in

a sweeping change in the hierarchy of Soviet officialdom, demotions and promotions were announced earlier today. They were featured by the elevation of Deputy Premier Kozlov, who now becomes a member of the all-powerful Secretariat of the Communist Party of which Khrushchev is the chief—Kozlov to inject more vigor into the party leadership. But, even more important, it seems to advance Kozlov toward the status of heir apparent, a step toward making him Khrushchev's eventual successor.

May 6, 1960

President Eisenhower today uttered three words that are echoing around the world, mere parenthetical words dropped casually in the middle of a sentence, three monosyllables—"If I go." This raises the surmise that President Eisenhower may possibly call off his trip to Soviet Russia. In Congress today the suggestion was made that he should refuse to attend the summit conference.

In Moscow today, in a noisy follow-up to Khrushchev's oratorial excitement yesterday, the Supreme Soviet informed the world that the American plane was downed by a rocket fired from the ground. One shot with an antiaircraft missile scored a hit. Russian papers today published photographs of the wreckage. The pictures showed—mere debris. There was no word about the civilian pilot, Francis Powers, who was flying the weather observation jet. Foreign Minister Gromyko, addressing the Supreme Soviet, ridiculed the supposition that the pilot may have blacked out at high altitude while flying on the Turkish side of the Soviet frontier, his plane, under automatic control, drifting across into Russian territory. Gromyko jeered at this, insisting that the plane had entered Soviet air space—deliberately.

(Editor's Note: *Over the week end of May 7 and 8, it was admitted in Washington that the U-2 jet plane shot down over Russia was, contrary to previous official denials, on a mission of aerial reconnaissance for the United States.*)

May 9, 1960

Tonight we have the official stand of the United States Government concerning airplane observation flights along the borders of Soviet Russia and inside Russia, too. Such reconnaissance has been made—and lots of it. Secretary of State Christian Herter calls it "extensive aerial surveillance." He says that the aerial espionage was ordered by President Eisenhower under the National Security Act of 1947, which directs our national defense officials to gather all the information they can to safeguard against the possibility of surprise attack. Ordinarily this aerial surveillance is done by planes with civilian pilots along the borders of the Soviets but occasionally by flights over Russian territory.

The general program was ordered by the President, but he does not give authorization for specific missions. He knew nothing about the jet plane which, according to Khrushchev, was shot down so far inside Russia, away over in the Urals. Unofficial information is that responsibility for that ill-fated adventure has not been determined. The important thing about it is the timing, shortly before the summit conference which begins on Monday.

Secretary Herter's public statement intimates that we will continue to conduct aerial reconnaissance trying to detect evidence of surprise attack. He calls this the duty of the United States Government in behalf of its own people and the whole free world. The way for Soviet Russia to stop it? To remove the fear of surprise atomic attack.

May 11, 1960

Has the summit conference been affected by the spy plane affair? President Eisenhower says, as far as he is concerned, the answer is "No." He still intends to go to Paris and there counter any Soviet accusations by again proposing his open-skies plan. That's the same plan he put forward way back in 1955—that each side carry on full aerial reconnaissance in order to prevent a surprise attack. The Russians have repeatedly rejected the Eisenhower open-skies plan. Hence the need for secret American flights over Russia, like the one on which pilot Francis Powers was captured.

President Eisenhower opened his news conference today with a formal statement which he read in a stern tone of voice. First, the President reminded the newsmen that espionage is necessary. He pointed out that we must have protection from a possible Soviet surprise attack. As he put it, "No one wants another Pearl Harbor." And, he said, fear of this exists only because the Russians keep their military preparations a mighty close secret. Secondly, our method of gathering intelligence information is sound and is, of course, conducted by a special agency of the Government, the CIA, whose operations must be kept secret. His third point, to take a realistic stand regarding intelligence operations. Little as we like the idea of spying we must do it and must go on doing it as long as there is any danger of aggression by the Soviet Union. The Eisenhower fourth point: that Khrushchev is using this plane incident as a red herring, trying to distract attention from the real issues which are disarmament and the easing of world tensions.

May 17, 1960

Tonight around the free world the consensus is that Khrushchev has overplayed his hand. Even critics of the United States are admitting that President Eisenhower did everything he could to keep the summit conference going. Khrushchev was so intransigent that it seems clear to observers around the world that he came from Moscow just to torpedo the conference. After all, he did get one key concession from President Eisenhower, that no more overflights would take place. President Eisenhower felt that he would demean himself and the free world by going any further. Khrushchev refused to be placated, repeatedly demanding an immediate apology, saying he would leave Paris if he didn't get it. He didn't get his apology so he says he's about to leave. The Big Four is breaking up with the cold war colder than ever.

Western diplomats all seem to feel that Khrushchev could have made a lot of capital out of the U-2 incident. The Soviet leader, however, spoiled his own case by his insulting attack on President Eisenhower.

A Paris newspaper today ran the following headline: "It Is the Fate of Khrushchev Himself That Is in Question," meaning what many have suspected, that Khrushchev may be slipping in the Kremlin struggle for power, bowing to the old-line Stalinists who want to keep the cold war going. The Paris newspaper suggested that Marshal Malinovsky, who represents the Stalinists and the Red Army, came to Paris to keep an eye on Khrushchev.

A lot of experts today seemed to agree with this diagnosis of Khrushchev under pressure, forced to be belligerent, maybe.

The question of West Berlin is a big "if" tonight. Some Western observers believe that Berlin was the real obstacle in Paris, not the flight of the U-2. Khrushchev could have swept that incident under the carpet, and might have, if the West had given him concessions on Berlin. Knowing that this was out of the question, Khrushchev may have used the American overflight as a pretext, to put an end to the summit conference.

THE COMMUNIST POSTURE, SUMMER 1960

By HOWARD K. SMITH
Washington Correspondent
CBS News

July 3, 1960

IN the past week, the long suspected friction between the two big Red partners, Russia and China, made its way into the open. Just as American gang leaders happened to congregate at a member's home in Apalachin, New York, not long ago, where Federal officers were able to learn vital information about them, so leaders of Communist parties in forty-six countries happened to attend the third congress of the Rumanian Communist Party in Bucharest last week. From articles in their home papers and from speeches made in Bucharest, it became clear that the conference was a vital one to clear up the world Communist Party line. Did Khrushchev's smashing of the summit conference and attacks on the United States mean that seeking peaceful coexistence with the West was now abandoned in favor of Stalinist friction with the West?

The Chinese sought fervidly to make the line a return to Stalinism. Their press said Western imperialism will cease to be a menace only when it goes down in war. Khrushchev and the Russian press, however, insisted that war would destroy communism and capitalism with sovereign equality, so peaceful coexistence was the only policy.

The European Communists supported Khrushchev. The Asian ones supported China. The two were patched together for appearance's sake in the final communiqué. But the rift is there and is likely to grow.

The difference exists because of basic national needs. Comparatively well-off Russians would be disheartened by a war threat, so Khrushchev must avoid one. Suffering and sacrificing Asians must be whipped with a war threat in order that they will continue to sacrifice, so a threat must be sustained.

Deeper down, the friction may be based on the population question. Red China's overcrowded population continues to grow at the frightening rate of more than a million more Chinese per month. They have no nearby place to ex-

Premier Khrushchev addresses the Bucharest meeting. It became an open forum on communist policy and showed the rift between Russia and China.

EASTFOTO

WIDE WORLD

President de Gaulle and Chancellor Adenauer part after discussion near Paris of Free Europe's role.

pand except the nearly empty areas of neighboring Soviet Siberia. Growing suspicion between the two is natural.

The other big event of the week—four more African colonial areas became independent nations. Since World War II, sixteen new nations have been born in Africa. These hungry, immature, new entities are bound to become a new arena of cold war as China may seek to export population to them, and Russia strives to move in to win their favor.

The Chancellor greets Prime Minister Macmillan in Bonn, there to confer on the danger to Free Europe.

WIDE WORLD

July 10, 1960

THIS week, Senator Lyndon Johnson said one of the problems the next president would find waiting for him was the prospect of Cuba serving as a Russian submarine base. In his Washington news conference this week, the President was asked what we would do and said we would take what steps were necessary to prevent or eliminate such a base. Yesterday, Khrushchev in a speech accused the United States of plans to invade Cuba and said he would hurl his giant rockets against the United States if we dared.

This was far the roughest threat to us since the Berlin crisis began.

The Soviet chief's motives seem transparent. He cannot and will not fire rockets against the United States, no matter what happens. He does not have enough of them. And the ease with which the U-2 penetrated Russian defenses for four years indicates that United States bombers could answer any attack a thousandfold.

Khrushchev's motives are doubtless to impress Latin countries with his far-ranging influence, reaching even into this hemisphere. They are to provoke the United States to some kind of action in order to wash Russia's hands clean of the Hungarian mass murders.

Doubtless China has the same motive —that is, to try to equalize by our treatment of a neighbor her genocide in Tibet, which has shocked all Asia. It is noteworthy that this week Red Chinese officials went to work in Cuba registering the names and facts about the 35,000 Chinese who live in that island.

July 17, 1960

THE week has provided good reasons for being concerned. There is no doubt that Khrushchev has mounted a general offensive against the thing that has plagued Russia most—the ring of United States alliances that have momentarily blocked

WIDE WORLD

UPI

Contrast in living between Chinese and Russian Communists: above, once-colorful Nanking Road in Shanghai displays only drab uniforms; right, on a Moscow street there is little visible sign of regimentation.

the progress of communism. The U-2 incident offered Khrushchev the opening, and he used it to threaten all United States allies with rocket destruction if further United States planes took off from their bases. In the past three years, thanks largely to Sputnik and a campaign of threat and boast, Khrushchev has created an impression in the world that the balance of strength in the world has shifted to Russia, which makes the threats more effective.

After the breakup of the summit, Japan provided Russia with her next opening, and there is no doubt that Japan's horror of wartime atomic destruction enabled the Communists to mount demonstrations that caused the President to drop his plan to visit Japan under humiliating circumstances.

Now, in a single week, when United States eyes were turned inward for our oldest and biggest party to wage battle over its presidential and vice-presidential nominations and their platform, Khrushchev has sent three notes to the United States—none aimed really for our ears, all aimed for the ears of allies of ours, threatening war and flexing muscles for purposes of fright. One accused the United States of more spy flights into Russia, this time from bases in Britain, in connection with a United States reconnaissance plane Russia shot down over the seas. Another declared the Monroe Doctrine was dead and that Khrushchev would help Castro's Cuba in connection with imagined United States plans for aggression. A third accused and threatened the United States for allegedly planning to bring the recently liberated and chaotic Belgian Congo back under so-called imperialist domination.

We do not know all the facts about the United States plane Russia shot down. But the notion that the United States seeks dominion over Cuba or the Congo is a blatant unvarnished lie and part of a plan to continue to erode respect for the United States as a leader.

August 7, 1960

AMONG dramatic and prophetic statements made during the conventions last month was one by the British Labor Party's defense expert, Mr. George Brown. Mr. Brown said in a debate in the House of Commons in London at that time that, with the United States engaged in bitter internal rivalry and Khrushchev tempted to influence or to exploit that circumstance, this—to quote the Labor Party leader—"may be the most dangerous autumn since 1939." American Cardinal

Spellman made the same prophecy in the same words in Munich yesterday.

Europeans apparently feel that quite literally to be true, and have begun to act upon it. Chancellor Adenauer, leader of West Germany, went to Paris for a conference with President de Gaulle of France. Next week, on Adenauer's invitation, Prime Minister Macmillan of Britain will go to Bonn for a talk.

The purpose of these conferences is to draw Free Europe together and to be prepared to take an independent lead in the event of trouble. In the words of the news service of Chancellor Adenauer's political party, "President de Gaulle and Chancellor Adenauer have made known their intention of not leaving to the United States alone the entire burden of initiative in dealing with the powerful and dangerous Soviet Union."

General Norstad, the American commander of the North Atlantic Treaty Forces in Europe, sought to reassure the allies by saying in a news conference that he would, in event of trouble, have the support of eleven Western forces, not just that inadequate force now directly under his command. In his message to Congress tomorrow, President Eisenhower may try to provide reassurance by indicating he will agree, after many indignant refusals, to spending more money on United States military forces.

The main place for expected trouble remains Berlin. East German puppets of the Soviet Empire sent West Germany a memorandum this week, repeating their accusations that the West has violated all rights to have free communications with Berlin. And in a letter to Prime Minister Macmillan, Khrushchev repeated his threat to take steps to end our free communications with Berlin. The British Government, the main source of last year's illusions that Khrushchev sought friendly, mutually advantageous negotiations, was reported shocked and angered.

However, Russia's chief effort to force turmoil has been not at Berlin but in the heart of Black Africa—in the big, disjointed Congo, which Belgium gave up as a colony last month.

There are several villains in the Congolese tragedy, but most of them are villainous through blindness or immaturity rather than malice. . . . The one villain in the piece acting from pure, unadulterated malice is the Russian empire. Though the UN has intervened, on Russian no less than on Western and neutral insistence, Russia has threatened to move in her own troops unilaterally. Her press has bitterly attacked the United States for allegedly having imperialist designs in the Congo and Mr. Hammarskjold of the UN for allegedly serving as a lackey to United States designs—this though United States behavior has been exemplary and Mr. Hammarskjold has been nearly heroic in extremely difficult circumstances.

Mr. Hammarskjold's problem has been to establish the presence of UN forces in all the Congo, without bloodshed and without frightening away the remaining Belgian technicians whose help is necessary to prevent total collapse and chaos.

Russia's simple interest is to pose as the champion of African independence, to demand the obvious, so that when it comes, Russia will be able to tell Africans it was her pressure which brought it about, and Russia that they should always look to.

Her unusual burst of fury at Mr. Hammarskjold this week may have had deeper motives. This year a total of fifteen former African colonies will become independent, facing the stresses and disappointments and difficulties that brings. Congo is the least prepared and the most disjointed and most likely to have trouble. With the United States diverted to an internal political battle of unprecedented fury, it may well be that Russia hoped that now was her chance to secure a foothold in the African continent.

Earlier this week, Mr. Hammarskjold was succeeding in his mission and bringing order. In fury, Russia turned on him. However, now it seems that possibilities of chaos and trouble have been reopened. A nation like Russia, for whom that is the main hope and universal policy, may still have a chance.

The Game of Canadian Politics

By BLAIR FRASER

Editor, Maclean's Magazine

(Presented through the courtesy of the Canadian Broadcasting Corporation)

Toronto, September 14, 1960

BRITISH COLUMBIA last Monday completed the full tally of ten provincial elections since the Federal Conservative landslide of 1958. This month the twenty-fourth Parliament of Canada will finish the first half of its maximum lifetime. It seems a good time to look back and tot up a kind of half-time score in the game of Canadian politics.

And the first thing you notice is that *no* party has much reason for complacency. They've all had setbacks of one kind or another.

Take Social Credit, for a start—the victor in British Columbia. In the last provincial election four years ago the Social Crediters took nearly half the popular vote; this time they got less than 40 per cent. Meanwhile they've failed to persuade their big vote-getter, Premier Manning of Alberta, to go into the Federal field, so their hopes of going anywhere nationally are as dim as ever.

That last point applies equally to the CCF (Co-operative Commonwealth Federation) and presumably to its still nameless successor, the New Party. In Saskatchewan, Premier Tommy Douglas had no great trouble beating all comers to win a fifth term in office, but the strong new drive in British Columbia fell a long way short of victory—only about a third of the popular vote, and that fraction so concentrated in industrial ridings that it carried only fifteen seats. The CCF made a small gain in the Ontario election last year, but not enough to matter much—and it's made no significant progress anywhere else.

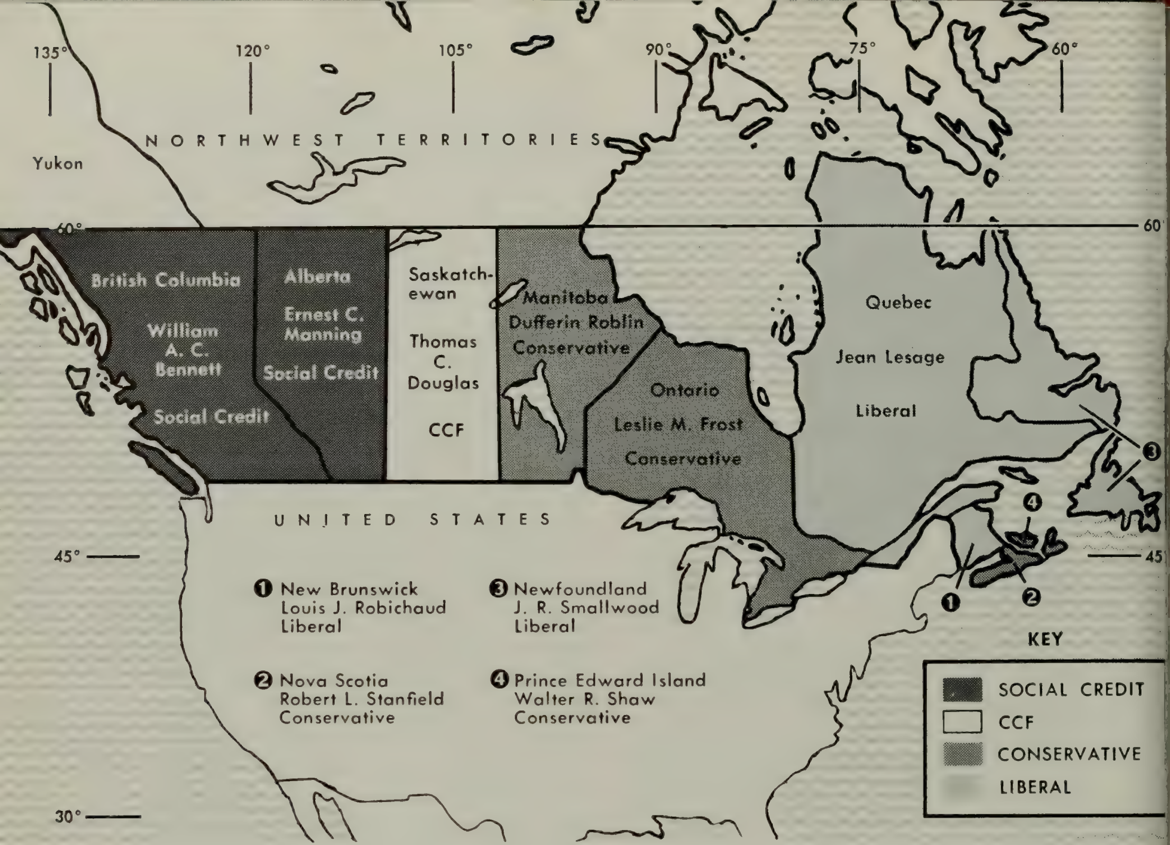
The Liberals have perhaps more to cheer about lately than the other three parties—two sensational victories, in Quebec and New Brunswick, and respectable gains in two other provinces. They've a good chance to pick up a Federal seat in the by-election in Labelle next month, and if they could do that and carry Peterborough as well, they really would feel cock-a-hoop.*

But the Liberals, too, have had their troubles. Still only one vote out of every five cast in British Columbia, indeed a slight *loss* of popular vote since 1956, even though they did win two more seats. A gain in Saskatchewan, but a puny one, in spite of gargantuan effort by a new and energetic leader, Ross Thatcher. Almost total extinction in Alberta last year; their Manitoba force cut to little more than half its former strength in opposition; defeat in Ontario and in two out of three Maritime Provinces; and even in Newfoundland something less than the crushing victory Premier Smallwood expected.

As for the Conservatives, they've probably suffered worst of all. Turned out of office in New Brunswick; wiped out entirely in Prime Minister Diefenbaker's own province of Saskatchewan and in British Columbia, where three of his senior ministers reside; their ammunition and wagon trains in Quebec captured when the *Union Nationale* was beaten; the Gallup Poll showing the sharpest drop ever in their estimated national support—this is a pretty doleful tale of news. And it's only moderate comfort that they did win four out of ten provincial elections. One was in Prince Edward Island, which has only about 50,000 voters all told, less than half as many as the one Toronto seat of York-

---

* *The Liberals won the by-election in Labelle; in Peterborough the winner was the New Party, a recent outgrowth of the CCF and the Canadian labor movement.*



On this map of Canada, the provincial parties in power and their leaders are shown as they were at the time when the twenty-fourth Parliament finished the first half of its maximum lifetime, in September 1960. As the author points out, "No party has much reason for complacency. They've all had setbacks of one kind or another." The Conservatives suffered heavy losses; the Liberals seemed to "have perhaps more to cheer about lately than the other three parties, two sensational victories, in Quebec and New Brunswick, and respectable gains in two other provinces." Mr. Fraser believes that Canadian politics will see many changes before much time has passed, since issues such as foreign policy, defense policy and nuclear disarmament are dividing the major parties. In many cases, also, provincial victories did not mean much in the Federal picture, since many winners had, in the main, only local popularity.

Scarborough; the other three victories were all scored by strong local champions—Duff Roblin in Manitoba, Robert Stanfield in Nova Scotia and Leslie Frost in Ontario. Not much cheer there for the Federal campaign strategist.

And if Canadian voters really were divided into political parties, there wouldn't be much cheer for Canada either in this mid-term picture of general disarray. Superficially it looks as if we had no political pattern at all in this country, as if we were roughly in the same state now as Italy is, or as France was before De Gaulle. Obviously that's not so. Obviously this sketch of mere party fortunes must be gravely misleading—but how? What *is* the pattern that does exist and what does it indicate for the future?

Well, a second look shows you one common factor at least, and that is the very opposite of the apparent dispersal of political forces. The common factor is a tendency to vote *for* stability, no matter what party may happen to represent it in a given region. The CCF won in Saskatchewan, where it was well established and the opposition divided. Social Credit did the same in similar conditions in Alberta and British Columbia, the older parties in the older provinces. Where governments were turned out, it was they that had begun to fall apart

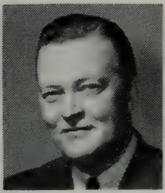
BENNETT

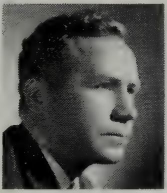
MANNING

DOUGLAS

ROBLIN

FROST


LESAGE


ROBICHAUD

STANFIELD

SMALLWOOD

SHAW

into factions, and they were replaced by parties lately knit into new unity.

What else?

They have been turned out in every recent case by a rival party that offered no radical change of policy or principle. Changes in execution, yes—promises to clean up this, correct that, turn the rascals out. But no party has come to power on a promise to make great fundamental changes in the voters' ordinary life, or in the role of government. In general, each party has accused the others of the same crimes, of omission and commission, which on its own part it denied. In effect, a defeat for any party in office was a kind of verdict of guilty from the electorate. This was true in the last Federal elections and it seems to have been true in the provincials too. Even in cases where great changes followed a change of government, as they have for example in Quebec, they have not in the main been the changes specifically promised. The people seem to have voted not so much for change as for a return to some ideal of conduct that they felt had been betrayed. And it's interesting to notice that in most cases, Federal and provincial, the defeated governments tend to agree in retrospect that perhaps it was time they were defeated.

The real political question in Canada is, can this mood continue? Can we, or anyway shall we, go on choosing new faces and new pairs of hands to carry out the same policies in the same way?

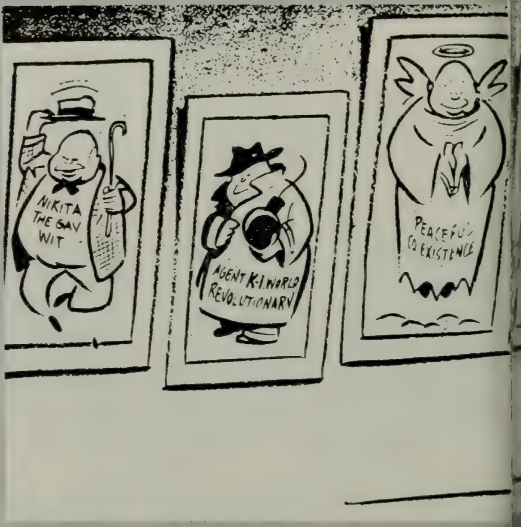
There are already some signs that the answer is no—that there will be some changes or, anyway, some choices before the Canadian elector pretty soon.

For instance, Canada has had no real change in foreign policy or the related field of defense policy since the 1957 election—or since the war, for that matter. Neither have the other Western allies. All of us in the North Atlantic Treaty Organization have been following much the same line with each other, with one government taking up more or less where the last one left off, even when pretty violent opponents have succeeded one another. The range of choice has been disconcertingly narrow.

This is no longer so. The emerging issue of nuclear weapons, or nuclear disarmament, whichever you want to call it, has already split the British Labor Party wide open. It is also dividing the major parties in Canada—the Liberal Party almost openly at the conference held last week in Kingston; the Conservatives in the privacy of caucus, according to widespread and plausible reports, and even in the cabinet chamber itself.

How these divisions are to be resolved, which major party will come down on what side, we must wait to learn. But at least it looks as if the period of apathetic unanimity, broken only by argument about personnel, is just about over.

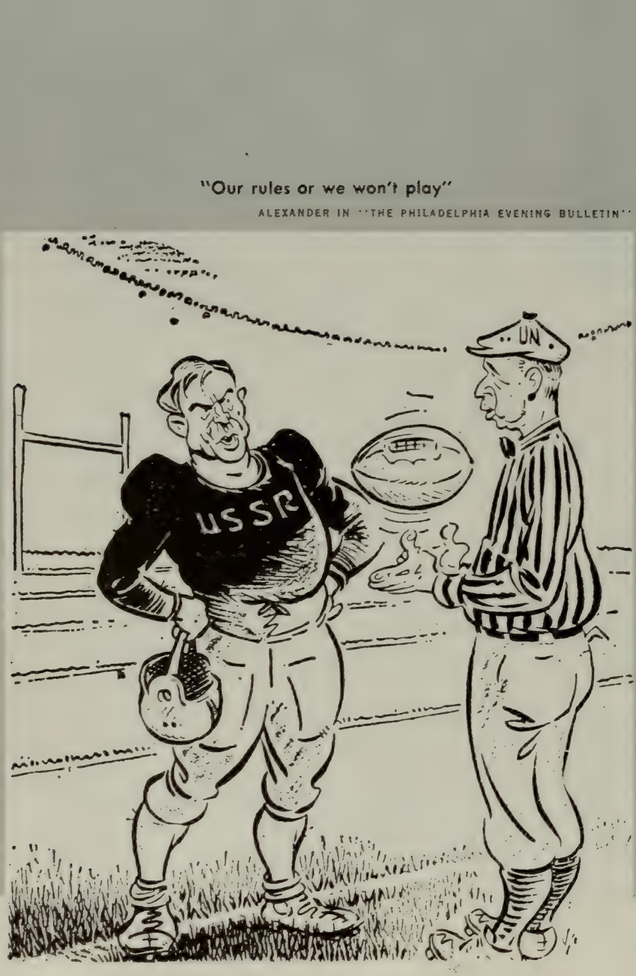
End-of-the-Year Cartoons



"Picture, picture on the wal

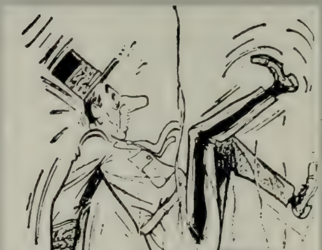
"Our rules or we won't play"

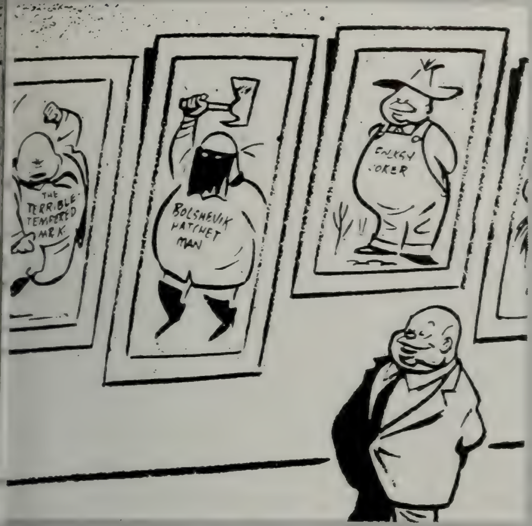
ALEXANDER IN "THE PHILADELPHIA EVENING BULLETIN"



"French cuisine"

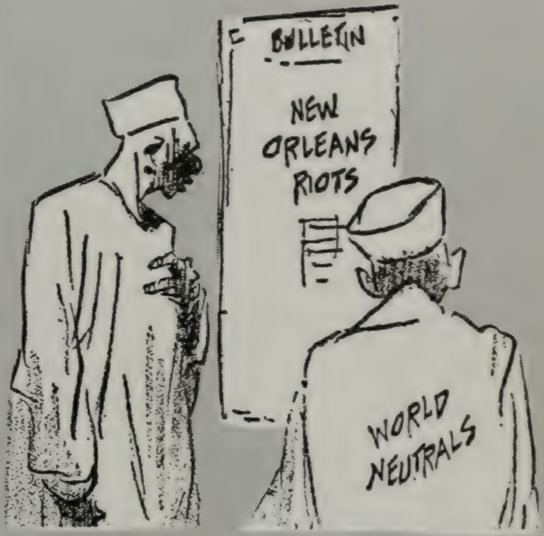
. FISCHETTI, NEA SERVICE





BASTIAN IN "THE SAN FRANCISCO CHRONICLE"

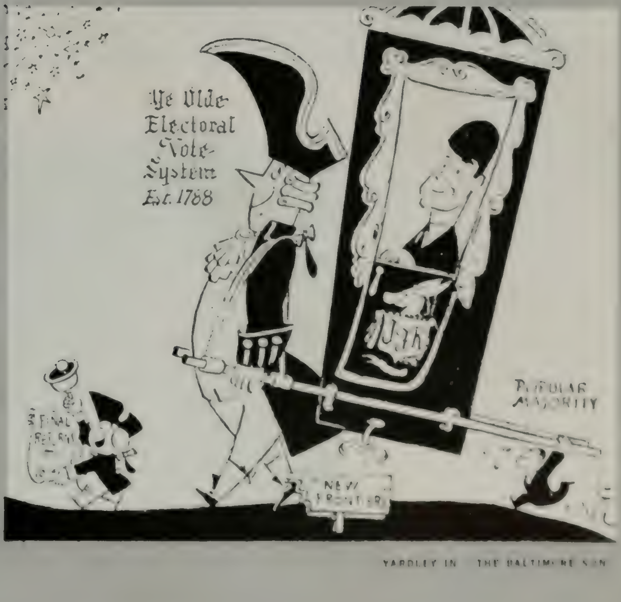
vho is the fairest of us all?"



YORK IN "THE LOUISVILLE TIMES"

"Prestige"

MAULDIN IN "THE ST. LOUIS POST-DISPATCH"



YARDLEY IN "THE BALTIMORE SUN"

WHAT THEY SAID WHEN IT HAPPENED is prepared from copyrighted material with the permission of the authors or publishers.

THE ENCYCLOPEDIA YEAR BOOK ASKS . . .

How Do You Feel about Man's Attempt to Conquer Outer Space?

The editors of *Encyclopedia Year Book* have written to a number of distinguished people in various fields of life, asking for their answers to this question:

Aside from military and defense considerations, how do you feel about man's vast attempt to conquer outer space?

Jacob K. Javits, *United States Senator:* As we enter the 1960's there is increasing realization of the significance that space exploration holds for the security and prosperity of the United States. Many practical advantages that immediately accrue from space technology overshadow the costs of the research and development programs. Increased knowledge of outer space has provided a tremendous stimulus to science and education; has increased health through food development and medical research; and expanded the national economy through the creation of new industries, growth of existing industries, broadened economic alliances with other countries and advanced the chances for realistic disarmament.

As a member of the Senate Labor and Public Welfare Committee and a former member of the Senate Space Committee, I have long been interested in the rewards that the conquest of outer space can provide. Associated studies are producing results that benefit everyday living in communications, agriculture, population expansion and weather prediction and modification. Research and development in space-related areas result in innovations that improve the quality of life throughout the United States.

The government, working with the United Nations, has dramatized the need for space co-operation internationally; on the domestic scene, by advancing the work of the National Science Foundation. It is moving toward full development of the potential benefits that space studies promise.

Henry Cabot Lodge, *former United States Representative to the United Nations (the*

Senator Javits: "Associated studies are producing results that benefit everyday living" in many fields.

BOTH PHOTOS, WIDE WORLD

Mr. Lodge: "UN discussion . . . has emphasized the principle of openness and availability of outer space."

following paragraphs are part of a statement made by Mr. Lodge in the UN General Assembly Political Committee on December 10, 1959):

Two years ago the first man-made earth satellite was placed in orbit. A succession of satellites has followed. These have advanced man's scientific knowledge and demonstrated new techniques for communications and meteorology. Some space probes have escaped beyond orbits around the earth. Notably, the Soviet Union has reached the moon and some probes have coursed far beyond. Animals have penetrated outer space as passengers aboard space vehicles and returned safely; man will doubtless follow soon.

The events of the past two years are starting to make clear the promise and the problems confronting man as he ventures into outer space. These beginnings challenge man's political and technological inventiveness. It is a prime task of governments and of the United Nations to see to it that political progress keeps pace with scientific change. Unless this is done the world runs the serious risk of relying on political institutions and arrangements that are outmoded and inadequate.

In surveying what has happened so far in man's activities relating to outer space and in planning for the future, we ought to inquire very candidly into the reasons for international co-operation in outer space and into the purposes which the United Nations can serve in this connection. I believe there are several important reasons and purposes for co-operation through the United Nations.

First, outer space is not the concern of one nation or of only a few. It is of interest to all. Fairness demands that there be an equitable sharing of benefits that may be derived from all operations in this new realm and of the burdens in carrying them on as well. Outer space cannot be anyone's private preserve. The idea of partnership in outer space has secured acceptance by member states of the United Nations without regard to their differing

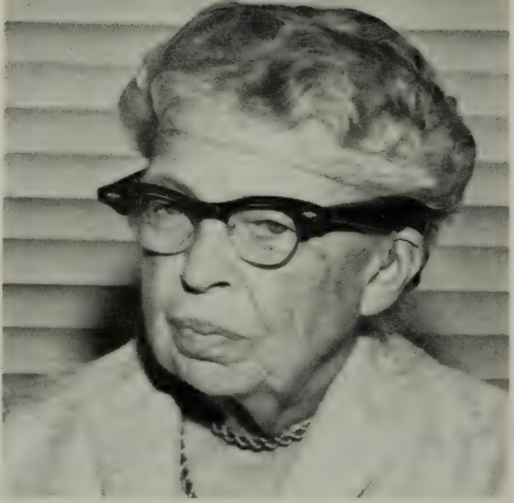
FORDHAM UNIVERSITY

Father McGinley: It is mankind's mission to use the "material universe" to "grow in knowledge."

JACOBS — AMERICAN MUSEUM OF NATURAL HISTORY

Dr. Mead: "Space can provide a new field" for those whose characters combine "bravery and protectiveness."

Mrs. Roosevelt: "It is one of the most important steps forward for man to be attempting to discover and understand what surrounds him in the world."



social and political philosophies. United Nations discussion during the last two years has emphasized the principle of openness and availability of outer space. International co-operation through the UN is surely an appropriate means for putting this principle into practice.

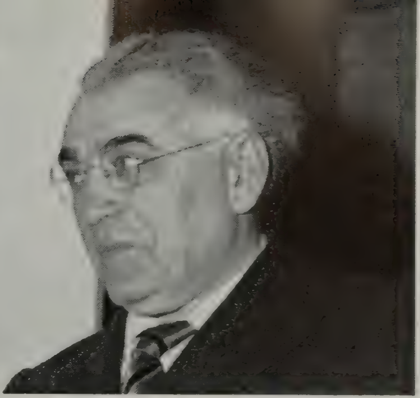
Secondly, co-operation among countries will inevitably be necessary for accomplishing many desirable projects in outer space. For example, if such projects require world-wide tracking or telemetering equipment or launching sites in certain geographical locations, or if their cost is too high for any one nation to bear, they will be literally impossible without international co-operation. For still other space activities, such as radio and television satellites, even though international co-operation may not be absolutely necessary, it will be required for maximum efficiency and usefulness. In general, joint enterprises in outer space will prove more effective than the efforts of any single nation, since each nation can contribute what it has in abundance or does best, at any given time. Already other countries have their contributions to make, and will develop greater capabilities in the future. If the knowledge of the more advanced nations is diffused, the abilities of all nations can be developed more quickly and brought into play. Through organized international co-operation, the contributions and capabilities of each country can be made most effective.

There is a very practical reason for international co-operation in outer space. Without it the manifold activities being progressively undertaken would begin to conflict and to frustrate each other. For example, the radio spectrum for space communications could become overcrowded and hopelessly confused.

There is still another reason to which we should pay the most serious attention. The cloud of an infinitely devastating nuclear war hangs over all nations. Men have learned how to accomplish world-wide destruction. Will they be able to forbear from aggressive use of force bringing all-out nuclear war in its train? The United Nations and its machinery were expressly designed to prevent such catastrophe. Governments continue to seek means for bringing unlimited competition in armaments under control and for instituting effective measures of disarmament. Working together on the challenges of outer space can provide governments with experience in regulating space activities that may prove valuable in the area of disarmament as well.

In sum, international co-operation in the exploration of outer space offers an avenue along which nations may approach mutual understanding and peace. Working *together* on the great challenges of explorations beyond the confines of earth can create a new perspective, in which national boundaries and national rivalries recede in importance. Common efforts in the conquest of space can forge a community of interest. Where community of

Dr. Schlesinger: "The conquest of space presents this century's crucial challenge to human intelligence and imagination."



BOTH PHOTOS, WIDE WORLD

Rabbi Silver: "The persistent human problem is not how to make . . . space safe . . . but how to make this world of ours safe for man!"

interest is strong enough there is unity of spirit and harmony in action. A new opportunity now presents itself for the operation of these forces. We should give it generous scope.

Reverend Laurence J. McGinley, S.J., *President, Fordham University:* Untold millions of dollars are being spent by us at present on an intensive program to make human space travel pass from a dream to a reality in the nearest possible future. Aside from the military urgency of keeping up with the Soviets as insurance for survival—is it all worthwhile?

I think it is, though the rate of our present spending might be considerably moderated in more peaceful times. There are two reasons I would like to bring forward why even outside of military necessity a mighty effort on our part to conquer space is justified. One is in view of our dignity and responsibility as Americans to give inspiration and leadership to the rest of the world in scientific advance. This has been proved over and over again in the course of the scientific revolution of the last few centuries: wherever there have been consistent courage and vision in carrying out basic research to extend our present knowledge of the universe there inevitably has followed a whole series of unexpected benefits to mankind which far outweigh the cost of the research that went into their discovery. In other words, the value of long-range confidence in the eventual fruitfulness of knowledge is a lesson writ too large in history for any nation to ignore that wishes to remain great. Who today would accuse Ferdinand and Isabella of Spain of being impractical spendthrifts for backing Columbus on the voyage that led to America's discovery?

But there is a second and even profounder justification than the ultimate practical benefits of new knowledge. It stems from our dignity and role as sons of God in a universe given us by its Creator for a purpose. It is part of the long-range, God-given mission of mankind that we make use of the material universe to help us grow in knowledge of and reverence for God, its Maker and our Father.

Dr. Margaret Mead, *Anthropologist and writer; Associate Curator of Ethnology, American Museum of Natural History:* I think the word "conquer" is most unfortunate. Whenever man has attempted to shape nature, to tame nature, to conquer nature, human civilizations have come to grief. Fertile plains become deserts, forests are destroyed and the balance among living things, including men, is dangerously disturbed. Space should represent a different sort of challenge: its emptiness should be a challenge to new kinds of constructiveness and creativity. Man should think of moving within space, of building within space, of expanding the known world by the inclusion of space. Colonizing space can present a sufficiently complex and technical challenge to protect our civilization from growing soft, once the possibility of warfare has become too dangerous to serve as a genuine incentive to effort and bravery. Through the ages, men have been given character by learning as children that someday they might have to risk their lives to protect their village, their tribe, their nation, their conceptions of freedom. Today, space can provide a new field for those in whose character bravery and protectiveness are combined. A failure to take full advantage of this possibility by government, by business, by those who write and paint and prophesy would be, in fact, what so many of our prophets of doom are always threatening—a sign that Americans have lost their sense of capacity to play a significant role in the next period of human evolution—within the solar system, not just on earth.

Eleanor Roosevelt, *Writer and lecturer:* I think it is one of the most important steps forward for man to be attempting to discover and understand what surrounds him in the world. All research requires money spent and money spent in ways that we do not immediately see will bring results, but knowledge of the world in which we live is bound eventually to be of value to mankind.

We are quite able to spend the money that is being spent on this research and still do what is necessary for the welfare of mankind on earth. Who is to know now whether what is discovered will justify the cost? It seems to me any new knowledge justifies the cost and I have no intention of quibbling about whether this or that amount should be spent in the attempt to gain greater understanding of outer space.

Arthur Schlesinger, Jr., *Author and Professor of History, Harvard University:* The conquest of space presents this century's crucial challenge to the human intelligence and the human imagination. If mankind should ignore this challenge, such faltering, in my judgment, would signal an appalling global failure of nerve. Audacity before the unknown has been an essential source of human creativity. If the human race were to flinch from the challenge of space, I would begin to fear that the energies of mankind were beginning to run down, and that this planet was commencing a long decline into mediocrity and oblivion.

Abba Hillel Silver, *Rabbi, The Temple, Cleveland, Ohio:* Every encouragement should be given to man's attempt to conquer outer space. It is part of man's privilege and destiny to learn all that he possibly can learn about the universe and to penetrate all of its mysteries. There is no reason why man's seeking and probing should be limited to this mundane world.

But when all is said and done—and this includes Sputniks and Echoes and mice, dogs and monkeys and, later on, men placed in orbit—the major problem of our day is not how to match our artificial moons and our intercontinental ballistic missiles with those of the Russians, but how to live in the same world with them. The persistent human problem is not how to make interstellar space safe for artificial satellites, but how to make this world of ours safe for man! The fundamental human problem is how to do away with the need for ballistic missiles and the A-bombs and the H-bombs altogether. The human situation remains what it was before the Russians launched their satellites and we ours. The human problem still remains how to accommodate ourselves one to another—nation to nation, system to system, race to race, religion to religion. Surely there must set in, sooner or later, unless we are resigned to catastrophe—I might almost say to annihilation—surely there must set in sooner or later, some rapprochement between the East and the West consequent upon the realization, the simple realization, that one power bloc cannot destroy the other without destroying itself. Surely the time must come, sooner or later, when the war-obsessed in both camps, the East and the West, and their incessant war scares and war cries must be pushed aside, and others who are not war-obsessed, but peace-inspired, must come to take their place of leadership in their respective worlds.

THE ENCYCLOPEDIA YEAR BOOK ASKS . . .

What Is the Cause of Slumps in Baseball?

One of the most interesting problems in sports today is the slump. A top-flight baseball player sometimes goes into a slump that lasts for weeks or even months before he can pull himself out of it.

Three baseball authorities here give their views in reply to the following questions from the editors of *Encyclopedia Year Book:*

Why does a topflight baseball player go into a slump? Are there any known causes—or, rather, what do you personally think are possible causes? And what do you think might be the cure?

Jim Brosnan, *Cincinnati Redlegs player and author of the book The Long Season:* "Slump," in the lexicon of the professional baseball player, has a sharply negative connotation. Mention of the word brings a frown to the sun-wrinkled face of every veteran ballplayer. It is significant that the Websterian definition of a physical slump so naturally coincides with the projected mental image of a right-handed hitter in the throes of one. Nervous tension that grips the slump-ridden, unrelaxed ballplayer may cause a crooked elbow, stiff knee or bent back, any one of which hinders proper execution of major-league play.

Basically, a slump is the result of a change in normal pitching or hitting patterns—a break in the rhythmic muscular co-ordination that is the whole of professional talent. The change may not be

HARPER & BROS.

Jim Brosnan pivots from a mighty swing of his pitcher's arm. In the accompanying text he charts the course of the player's dread, the slump.

The cause and cure of slumps? Commissioner Ford Frick spreads his hands in a "Who knows?" gesture.

BOTH PHOTOS, WIDE WORLD

Jackie Robinson, here leaning on his collection of souvenir bats, considers slumps part of the game.

gross, and it may be obvious only from the disastrous results. That it can't be seen objectively aggravates the despair of the hitter or pitcher. He tries subjectively to compensate, upsetting his timing, balance or relaxed reflexive movements. Frequently this compensation proves even more disastrous. He slumps completely, into a semblance of physical relaxation, and thence returns to his fundamental, competitively experienced, competitively proved professional reactions. End of slump.

Ford Frick, *Commissioner of Baseball:* The slump is every bit as much a part of baseball as the ninety-feet base line. When it will start or when it will stop are things that no one would dare try to determine. The biggest stars are just as liable to go into a slump, and for just as long, as the fellow who is having trouble making the team. And it can happen to an entire team as quickly as it can to an individual player. And, worst of all, slumps can breed slumps. The hitter who finds himself worrying about his lack of base hits can also find that it affects his fielding.

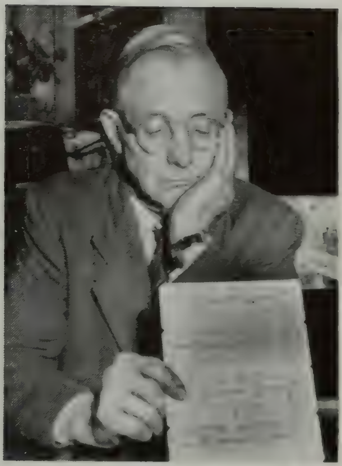
As to cause and cure of slumps, there's a million dollars waiting for the fellow who can come up with either. A physical fault, such as moving the head or swinging too hard, can send a batter into a slump. So can off-field matters, like sickness in the family or personal problems. But so, too, can slumps be born of the

WIDE WORLD

A player in a slump has to expect jeers from fans as well.

LEO O'MEALIA IN "THE NEW YORK DAILY NEWS"

Woe for Casey Stengel: "slump" shapes his face in a cartoon.



WIDE WORLD

Milwaukee man Barney Ward; slump cost his team a pennant.

most mysterious things, never explained, and vanish as quickly as they come.

I don't think I have ever known a ballplayer who, at one time or another, has not gone through a slump. Nor do I ever expect to know one. For in the baseball world the two legendary "inevitables," death and taxes, are joined by a third—slumps.

Jackie Robinson, *former Brooklyn Dodgers player:* Frankly, I don't think there is a really good answer for the cause of slumps. I don't know what causes them and doubt seriously if anyone does. I therefore feel I would only be guessing as to the cause, hard as I might try to pin it down in clear-cut terms.

As you know, baseball is a matter of inches and luck. Some fellows are in a slump and are hitting the ball as well as ever. Luck sometimes deserts a player, and he is in a slump. A person's health often is a factor, and nothing can be done about it. I feel that a person playing 154 games a year must expect this.

The good hitters don't stay in a slump long because they realize this is part of the game and swing the same as best they can, keep the same stance and hope luck comes back.

There is nothing more I can say. I repeat, I don't believe anyone knows the answer. If they did, there would be no need for them to work. They could tell it to the players and do well.

NBC

A SUMMING UP

. . . about what happened

NEWS EVENTS OF 1960
Bryan Bunch 50

. . . and about people

WORLD LEADERS MEET
AT THE UNITED NATIONS 80
HEADLINERS OF OUR TIME 82
AMONG THOSE WHO DIED 84

A SUMMING UP

NEWS EVENTS IN 1960

President Eisenhower watches as Premier Kishi and Secretary Herter sign the Japan–United States mutual security pact almost fifteen years after Japan's unconditional surrender aboard the U.S.S. Missouri.

JANUARY

HISTORIC HEADLINES

Crisis in the Fifth Republic. At noon on January 24, in Algiers, a crowd of European colonists (colons), students and members of the Home Guard, also Europeans, gathered to protest French President Charles de Gaulle's policy of self-determination for Algeria. The three choices that President de Gaulle had proposed for Algeria were integration with France, total separation from France or membership in the French Community. Most Europeans were afraid that Algeria's Muslim majority would choose separation. The Europeans, however, were violently in favor of integrating Algeria with France. Twenty-four persons were killed in an attempt by French gendarmes to disperse the crowd, which did not break up but took shelter behind barricades. For several days, soldiers and police guarded the barricades, allowing wives and friends of the integrationists to pass.

The trouble was touched off by the removal of Major General Jacques Massu from his post as head of the Algiers area. The General and much of the French Army stationed in Algeria were against President de Gaulle's policy. Considerable doubt was expressed as to whether the Army would prove loyal to the President or to the colonists.

The turning point of the crisis came on January 29, when President de Gaulle made a speech on radio and television. Dressed in his general's uniform, he told the Army that no soldier must associate himself even passively with the integrationist, or insurrectionist, movement. He ordered the Army to restore order in Algeria. By January 31 members of the Home Guard began to leave their positions behind the barricades. The Army proved, in the last analysis, to be loyal to the French Government.

Sabotage Aloft Suspected. The year's first airline disaster occurred on January 6. A National Airlines DC-6B, en route from New York to Miami, exploded in the air above North Carolina, killing all 34 aboard. Senator Mike Monroney, chairman of a subcommittee investigating air safety, charged that the disaster was a "case of suicide by bombing." Chief suspect was Julian Andrew Frank, a Westport, Connecticut, lawyer, who had taken out $887,500 worth of life and accident insurance. His body, which bore evidence of an explosion, was found sixteen miles from the others.

From January 18 through January 21, three more airliners crashed, bringing the month's death total to 162. The wave of disasters brought forth a general demand for action to provide safer air travel, with particular safeguards against sabotage.

New facts about a November 16, 1959 plane crash in the Gulf of Mexico revealed the possibility of another case of sabotage. On January 20 the Federal Bureau of Investigation arrested Robert V. Spears, who had been listed as one of the forty-two passengers killed in the disaster. Mrs. Spears disclosed that her husband had persuaded a friend, William A. Taylor, to take his place on the flight. The FBI suggested that Spears might have planted a bomb on the plane so that his wife could collect $100,000 insurance.

An Iowa synagogue is defiled by the mark of anti-Semitism; many such swastikas appeared in January.

Behind low paving-stone barricades, Algerian Rightists stand at attention before the French tricolor.

PHOTOS, WIDE WORLD

CHRONOLOGY OF EVENTS

1. **Cameroon:** Rioting marred the celebration at which Premier Ahmadou Ahidjo officially proclaimed Cameroon independent from France.

2. **United States:** Senator John F. Kennedy announced his candidacy for the Democratic presidential nomination.

4. **United States:** Negotiators for the steel industry and the United Steelworkers of America accepted a compromise put forward by Vice-President Richard M. Nixon and Labor Secretary James P. Mitchell.

6. **West Germany:** In response to a wave of anti-Semitism the Government announced that it would propose harsher sentences for convicted anti-Semites. **United States:** The Eighty-sixth Congress began its second session.

7. **Ghana:** Prime Minister Kwame Nkrumah said that his country would be willing to yield its sovereignty to any union of West and East African states. **Canada:** The National Union Party of Quebec chose Antonio Barrette premier of the Quebec government, succeeding the late Paul Sauvé. **United States:** In his State of the Union Message, the President stated that his proposed budget for the year ending June 30, 1961 would show a $4,200,000,000 surplus. He suggested that this surplus should go toward paying off the national debt.

9. **United Arab Republic:** President Gamal Abdel Nasser threw the switch that detonated ten tons of dynamite, starting construction of the Aswan High Dam. The Soviet Union was financing the project's first stage with a $93,000,000 loan. **France:** It was announced that the Soviet Union, Czechoslovakia and Poland had agreed to join the International Council of Scientific Unions' Committee on Space Research (COSPAR). (COSPAR was formed to continue the international scientific co-operation that began with the International Geophysical Year.) **United States:** Vice-President Nixon's office announced that the Vice-President would be entered, with his consent, in three presidential primaries.

11. **Cuba:** The Government rejected a United States note protesting that the Cuban National Agrarian Reform Institute was seizing land and buildings without written authorization or issuance of receipts by the Cuban Government. **India:** The Government announced substantial agreement with Pakistan on the boundaries between West Pakistan and India. **United States:** State Department representative Charles E. Bohlen and Soviet Ambassador Mikhail A. Menshikov began negotiations toward payment of Russia's World War II lend-lease debt to the United States. . . . A Federal judge, invoking the 1957 Civil Rights Act, put 1,377 Negro voters' names back on the polls of Washington Parish, Louisiana. It was the first government victory under the Civil Rights Act.

13. **France:** Finance Minister Antoine Pinay left the Government of Premier Michel Debré. Wilfrid Baumgartner was named new finance minister.

14. **France:** In Paris a thirteen-nation Special Economic Committee initiated studies leading toward the creation of a transatlantic economic group and toward more co-operation in aid to less-developed countries. **Canada:** Governor General George P. Vanier opened the third session of the Twenty-fourth Parliament in Ottawa. **United States:** The Federal Trade Commission issued complaints charging four companies and their advertising agencies with misrepresentation of the companies' products over television. . . . President Eisenhower ordered an accelerated program for the Saturn rocket, a high-thrust vehicle intended for space exploration.

15. **Soviet Union:** In response to a request made by Premier Nikita S. Khrushchev on January 14, the Supreme Soviet passed a resolution to reduce armed forces by 1,200,000 men.

18. **United Arab Republic:** The Government revealed that the Soviet Union had agreed to finance the second stage of the Aswan High Dam project. **Great Britain:** Independence for Cyprus was postponed because of disagreement about the size of British bases on the island.

19. **United States:** Japan, represented by Premier Nobusuke Kishi, and the United States signed a "treaty of mutual co-operation and security" that commits the United States to defend Japan against aggression.

21. **Great Britain:** The bank rate, which is the interest rate paid by banks borrowing money from the Bank of England, was raised from 4 per cent to 5 per cent. **Soviet Union:** The Government announced that a rocket had traveled nearly 8,000 miles on January 20, hitting within about 1¼ miles of its target.

22. **United Nations:** El Salvador, Honduras and Guatemala announced agreement on an economic association leading toward a free-trade area.

23. **United States:** The Navy announced that Jacques Piccard and Lieutenant Don Walsh had descended more than seven miles below

the ocean's surface. Their bathyscaph, the Trieste, landed on the bottom of the Marianas Trench in the Pacific Ocean.

27. **Belgium:** The Government accepted June 30, 1960, as the independence date for the Belgian Congo. **United States:** Charles Bohlen, American repesentative at talks on settling the Soviet lend-lease debt, broke off the series of conferences because Russia wished to broaden the talks to include trade and credits. . . . The Justice Department started antitrust actions against two drug companies, charging that monopolistic practices had created artificially high prices for tranquilizers.

28. **United States:** The National Aeronautics and Space Administration revealed that the Government planned 260 satellite launchings and space probes from 1960 through 1970.

31. **Israel:** Border patrols of Israelis and Syrians engaged in the largest military action in the area since 1956.

• • •

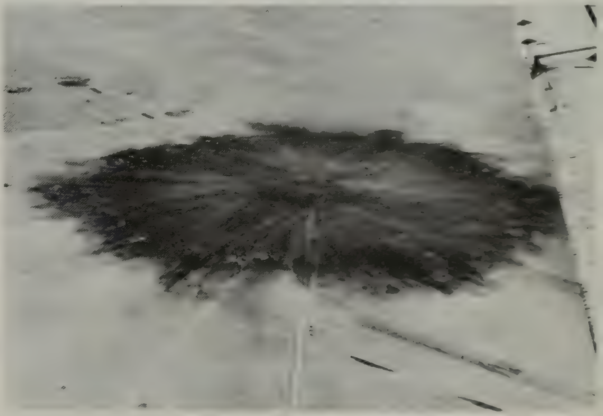
FEBRUARY

HISTORIC HEADLINES

France Joins the World's Nuclear Club. For eight years French scientists worked to perfect a "home-grown" nuclear bomb. The French felt that they must possess nuclear weapons to raise their country's status among the nations. France had rejected United States offers of a nuclear stockpile on French territory because the United States would allow only American officials to decide when, whether and how the bombs should be used.

Finally, on February 13, the French Government announced that it had exploded a nuclear device in the Sahara. It was estimated that the bomb was about as powerful as the American atomic bomb exploded over Hiroshima in 1945.

World reaction to the French test was largely negative. Even those countries that did not actually condemn the test did not, with the exception of West Germany, send congratulations. The newer African nations, particularly those near the test site, were especially hostile. Ghana froze all French assets until such time as the effects of the first and later tests were known. Morocco broke off the French-Moroccan diplomatic agreement that had provided for the two countries to work together on foreign policy and for French ambassadors to represent Morocco in some countries.



UPI

A black scar on the sands of the Algerian desert is the visible result of France's nuclear-bomb test

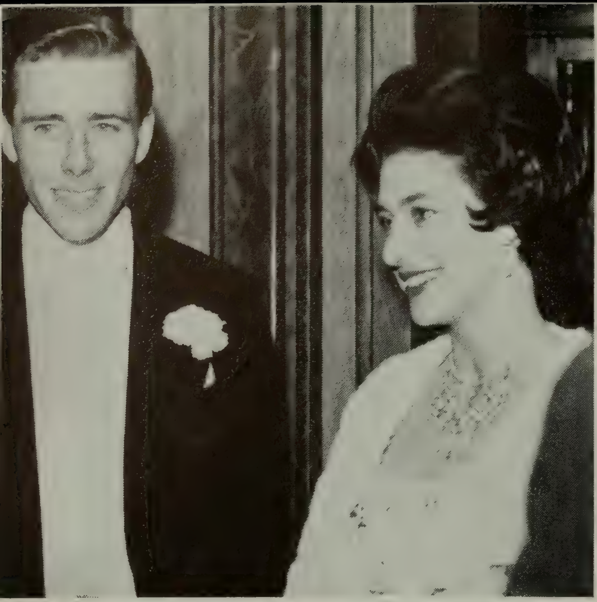
Khrushchev and Eisenhower on Tour. February saw the leaders of the Soviet Union and the United States each embark upon a four-nation round of diplomatic visits that would last into March.

Premier Khrushchev arrived in New Delhi, India, on February 11. The crowd welcoming him was about one quarter the size of that greeting President Eisenhower in December 1959. The Premier stayed in India for five days, stopped off in Burma for thirty-six hours and then arrived in Indonesia for the major visit of his tour. He began to appear noticeably tired after constant sight-seeing with President Sukarno. But everywhere he traveled, Premier Khrushchev had enough energy to denounce "Western imperialism" and urge acceptance of Soviet economic aid.

President Eisenhower flew to Puerto Rico on February 22. The following day he continued to Brazil, where he and Brazilian President Juscelino Kubitschek called for a "hemispheric crusade for economic development." In Argentina on February 26 nearly a million persons welcomed "Ike" to Buenos Aires. He and Argentine President Arturo Frondizi declared jointly that they would continue to work for improved economic standards and to maintain a policy of nonintervention in the Americas. On the last day of the month, President Eisenhower arrived in Santiago, Chile.

CHRONOLOGY OF EVENTS

1. **Algeria:** In Algiers, the Right-Wing integrationists surrendered to the French Army.



BRITISH INFORMATION SERVICES

Princess Margaret and Mr. Antony Armstrong-Jones attend a gala performance of the Royal Ballet.

FEBRUARY (Cont.)

India: An anticommunist alliance in Kerala State won 94 of the 126 Assembly seats. On the other hand, Communists and parties with communist backing showed a more than 2-percent rise in popular vote over their 1957 election win.

2. **Israel:** The United Nations Israeli-Syrian Mixed Armistice Commission asked Israel and the United Arab Republic to withdraw their forces from one of the "demilitarized" zones between Israel and the Syrian Region of the U.A.R.

3. **France:** The National Assembly and the Senate granted Premier Debré and his Cabinet the power to legislate by decree for one year. The Premier stated, however, that President de Gaulle would make all important decisions. **South Africa:** British Prime Minister Harold Macmillan told the South African Parliament that Britain could not approve of some of South Africa's policies.

4. **Soviet Union:** The members of the Warsaw Treaty stated that if the German Question were not settled without "procrastination" they would sign a separate peace treaty with East Germany.

5. **France:** The Government was reorganized; Minister Delegate Jacques Soustelle and Minister of Postal, Telephone and Telegraph Services Bernard Cornut-Gentille were dropped from the Cabinet. **Cuba:** An anticommunist demonstration marked Soviet First Deputy Premier Anastas I. Mikoyan's visit to Havana. **United States:** The Venezuelan Ambassador announced that his country had asked the Organization of American States to investigate the Dominican Republic. He charged the Dominican Government with mass arrests and suppression of human rights in violation of the OAS charter.

6. **Burma:** Former Premier U Nu's "clean" faction of the Anti-Fascist People's Freedom League won 157 of the 250 seats in the Chamber of Deputies.

7. **Argentina:** The Navy announced that a foreign submarine had been detected in Golfo Nuevo, a forty-mile-long sea arm in southern Argentina.

11. **Switzerland:** At the nuclear-test-ban talks in Geneva the United States proposed a ban on all tests that could be detected by present-day means. The Soviet delegate declared the plan "unacceptable."

13. **Cuba:** Premier Fidel Castro and Soviet First Deputy Premier Mikoyan signed an extensive trade and credit agreement.

WIDE WORLD

The ancient port and resort city of Agadir, Morocco, lies in rubble after a series of devastating earthquakes destroyed most of the Muslim quarter and killed 12,000 people.

14. **United States:** The National Aeronautics and Space Agency announced that it would, with a United States rocket, launch a Canadian-built satellite during 1961.

16. **Switzerland:** At the test-ban talks in Geneva the Soviet Union offered to accept for two or three years Western scientific standards for nuclear-test detection, provided that the number of on-the-spot inspections be limited to a "very small," politically determined annual quota. **Israel:** The United Nations Armistice Commission condemned Israel for having "created a serious tension" along the Israeli-Syrian border. Israel boycotted the meeting.

17. **United States:** President Eisenhower stoutly defended his Administration's defense policies against mounting criticism.

18. **Uruguay:** Meeting in Montevideo, foreign ministers of Argentina, Brazil, Chile, Mexico, Paraguay, Peru and Uruguay signed a treaty providing for eventual free trade among their countries.

19. **Great Britain:** Queen Elizabeth II gave birth to a son. **United States:** Governor Edmund G. Brown of California granted Caryl Chessman a sixty-day reprieve so that the state legislature could consider abolition of capital punishment. Governor Brown said that his decision to grant Chessman his eighth stay was influenced by a State Department telegram saying that the execution might inspire riots during President Eisenhower's Latin American tour. . . . The Government admitted that the flight of an airplane that crashed in Cuba on February 18 had originated in Florida. **Cuba:** Premier Castro said that the American-based plane had tried to bomb a sugar mill on the island.

23. **Argentina:** The Navy admitted that two foreign submarines found in Argentine waters had escaped. **Japan:** A son was born to Crown Prince Akihito and Princess Michiko. **United States:** Civil Aeronautics Board Chairman James R. Durfee told a Senate subcommittee that dynamite residue had been found in the wreckage of the airplane that crashed on January 6. . . . Rioting erupted in Chattanooga, Tennessee, between whites and Negroes. Negro students were attempting, by passive-resistance techniques, to end segregated lunch counters in the South.

24. **Italy:** After losing the support of the Liberal Party, Premier Antonio Segni presented the President with his resignation and the resignations of his cabinet members.

25. **Brazil:** A Brazilian airliner and a United States Navy plane collided over the bay of Rio de Janeiro. Sixty-one persons were killed in the accident, including 19 members of the touring United States Navy band.

26. **Ireland:** An Italian airliner crashed during take-off from Shannon International Airport, killing at least 27 persons. **Great Britain:** It was announced that Princess Margaret would marry Mr. Antony Armstrong-Jones, a photographer. **United States:** The Senate accepted Senator Lyndon B. Johnson's proposal for round-the-clock debate on civil rights. . . . The State Department announced that military aid to Cuba and the Dominican Republic would cease, as of June 30, 1960.

28. **Communist China:** Premier Chou En-lai agreed to meet Indian Prime Minister Jawaharlal Nehru on Indian-Chinese border problems. **United States:** The Soviet Union gained the highest unofficial point standing at the Winter Olympics, with Sweden second and the United States third.

29. **Morocco:** An earthquake struck Agadir, killing several thousand persons. **United States:** The Supreme Court, reversing a lower court's decision, declared that the key section of the 1957 Civil Rights Act is constitutional. The Justice Department, by this key section, is empowered to initiate civil suits against those interfering with Negro voting rights. . . . The Government informed Cuba that it was willing to negotiate differences between the two countries, but that it could not accept previous Cuban conditions for negotiation.

• • •

MARCH

HISTORIC HEADLINES

Progress at Geneva. The interlocking questions of disarmament and nuclear-test bans came into sharper focus in March at two conferences in Geneva, Switzerland.

On March 14 the West revealed its proposal for controlled elimination of armaments and for creation of an international organization to preserve world peace through disarmament. On March 15 the communist members of the ten-nation disarmament committee objected to this plan. In spite of this unpromising start, the Soviet Union on March 21 offered to revise its proposed timetable, agreeing that nuclear weapons might be banned before conventional arms. Three days later, however, the Soviets insisted that they could not permit total aerial inspection until total disarmament had been achieved. On March 25, Chief Soviet Delegate Valerian A. Zorin complained that the West wanted to set up control systems before agreement on arms reductions.

Talks on nuclear-test bans had been in progress for about a year and a half with slow but steady progress. On March 19 the Soviet Union suddenly offered to accept the United States plan, provided that all atomic tests were suspended until methods were developed to detect small, underground tests. In the Western plan these underground tests were to continue. British Prime Minister Macmillan and President Eisenhower, after conferring in the United States, announced on March 29 that their governments would be willing to accept a suspension if a time limit could be agreed upon.

Many differences were not yet resolved, but the way seemed clearer for a satisfactory agreement on nuclear testing. The Soviet delegation called the Western stand "encouraging." It seemed probable that solution of the nuclear-test-ban problem would lead to a more optimistic atmosphere for the disarmament talks.

Apartheid Pushed to the Wall. World-wide reaction began against the Union of South Africa's policy of apartheid. This enjoins complete separation of Africans and colored groups from whites of European descent. It discriminates in favor of the whites. Union police fired on demonstrators on March 21. The African demonstrators were protesting laws that required them to carry identity passes at all times. On March 21 and 22 seventy-two Africans were killed and 184 wounded. The United States State Department informed South Africa that "while the United States, as a matter of practice, does not ordinarily comment on the internal affairs of Governments . . . it cannot help but regret the tragic loss of life resulting from the measures taken against the demonstrators. . . ." Complaints against South Africa by twenty-nine Asian and African nations poured into the United Nations.

On March 24 the Union Government banned, until the end of June 1960, all assemblies in heavily populated areas. Two days later the police announced that, as a temporary measure, Africans would not be arrested for failing to carry passes. The police also announced that Africans would no longer be arrested and detained for trivial offenses. In spite of this there was a 90 per cent effective work stoppage and more rioting on March 28. The next day Minister of Justice François C. Erasmus asked Parliament to outlaw the principal African political parties. Early the next morning leaders of the parties were arrested, as well as many of their followers. Thirty thousand Africans marched on Parliament and demanded their leaders' release. Much of South Africa was declared to be in a state of emergency.

On March 30 also the Security Council of the United Nations took up the charges against South Africa. On the last day of the month, Ecuador introduced a resolution deploring South African policies and calling for the end of apartheid.

CHRONOLOGY OF EVENTS

1. **Morocco:** Further earthquake shocks, followed by fire and a tidal wave, completed destruc-

Thirty thousand Africans march to Cape Town, South Africa, to protest the jailing of more than one hundred of their political leaders.

PHOTOS, WIDE WORLD

Senators rested on cots in the old Supreme Court chamber during round-the-clock civil-rights sessions.

tion of the city of Agadir. The death toll was estimated at about twelve thousand people. **Chile:** In Santiago, President Jorge Alessandri Rodriguez and visiting United States President Eisenhower issued a joint communiqué including an appeal for a general limitation of arms purchases in Latin America.

2. **Afghanistan:** Soviet Premier Khrushchev received a warm welcome in Kabul. **Uruguay:** President Eisenhower was greeted enthusiastically upon his arrival in Montevideo. He was briefly inconvenienced by a whiff of the tear gas used to quell one of two student demonstrations along his route. The President declared it "a very small thing" compared to the general friendliness of the crowd.
4. **Cuba:** A series of explosions aboard a French munitions ship in Havana harbor destroyed the ship and several nearby buildings, killing nearly one hundred people.
5. **United States:** The Senate recessed for the weekend, after sitting through 125 hours and 31 minutes of Southern filibuster on civil rights, with only one 15-minute break.
8. **United States:** President Eisenhower, in a broadcast to the American people, spoke in general of the Latin American countries and specifically explained the United States policy of nonintervention in Latin American affairs. . . . Senator John F. Kennedy reduced the traditional two-to-one Republican lead in the New Hampshire presidential primary election to a three-to-two margin.
10. **United States:** Under pressure from the White House, Federal Communications Commission Chairman John C. Doerfer resigned. Mr. Doerfer had accepted favors from a radio-television executive. . . . A committee of the California Legislature killed a bill that would stop capital punishment in the state.
11. **United States:** Scientists launched an artificial planetoid ("minor planet"), Pioneer V, toward an orbit around the sun. . . . The new Development Assistance Group (composed of Belgium, Canada, France, Great Britain, Italy, Japan, Portugal, West Germany and the United States), which co-ordinates programs of assistance, agreed to increase aid to less-developed nations.
12. **France:** British Prime Minister Macmillan arrived in Paris for an informal weekend conference with President de Gaulle. **United States:** West German Chancellor Konrad Adenauer began an informal visit scheduled to include conferences with President Eisenhower and other government officials.
13. **Soviet Union:** Tass, the official news agency, announced that Premier Khrushchev would delay his planned trip to France several days because he was ill with the grippe. **United States:** Signals from Pioneer V were received from an estimated 409,060 miles in space, setting a new record for long-distance communication.
14. **United States:** Israeli Premier David Ben-Gurion and West German Chancellor Adenauer met, for the first time, in New York, to discuss mutual problems of their countries.
15. **Argentina:** The Government declared the "organization of the nation for a time of internal war" and arrested hundreds of union leaders and followers of ousted dictator Juan

D. Peron. **South Korea:** In an election marred by violence, Dr. Syngman Rhee won his fourth term as president. **United States:** In Orangeburg, South Carolina, more than 350 college students were arrested for participation in a nonviolent demonstration.

16. **United States:** President Eisenhower indicated that he supported Vice-President Nixon for the Republican presidential nomination.

17. **United States:** A Lockheed Electra turboprop airliner exploded over Indiana killing all sixty-three persons aboard.

21. **Communist China:** Nepal and China agreed on boundary lines between Nepal and Tibet. **Ceylon:** Dudley S. Senanayake of the Rightist United National Party became prime minister.

23. **France:** Soviet Premier Khrushchev arrived in Paris at the start of a state visit.

24. **United States:** The House of Representatives passed and sent to the Senate a civil-rights bill that included the main administration proposal for safeguarding voting rights. . . . Senator Stuart Symington of Missouri announced his candidacy for the Democratic presidential nomination.

25. **Italy:** Fernando Tambroni, former Premier Segni's minister of the budget, succeeded in forming Italy's twenty-first postwar Government, thus ending a month-long cabinet crisis. Premier Tambroni's new Cabinet, formed entirely of Christian Democrats, still required Parliamentary approval.

26. **France:** Premier Debré and President Philibert Tsiranana of the Malagasy Republic declared that Malagasy—the island of Madagascar—would become independent but retain close ties with the French Community.

27. **Argentina:** Despite a large loss in votes and parliamentary representation, President Arturo Frondizi's Radical Intransigent Party retained a small majority in the Chamber of Deputies.

28. **Vatican City:** Seven churchmen were publically elevated to the Sacred College of Cardinals. The new princes of the Church included the first Negro, Japanese and Filipino cardinals. Three men were named cardinals *in pectore*, or secretly, "in the breast" of the Pope. It was expected that the names of the three would be disclosed at a later date.

29. **France:** In Rheims, Premier Khrushchev said, "I am disturbed by [West German Chancellor] Adenauer's declaration in Rome that Germany has a divine mission to save Europe. We cannot reconcile ourselves to this Hitlerite theory . . ."

● ● ●

APRIL

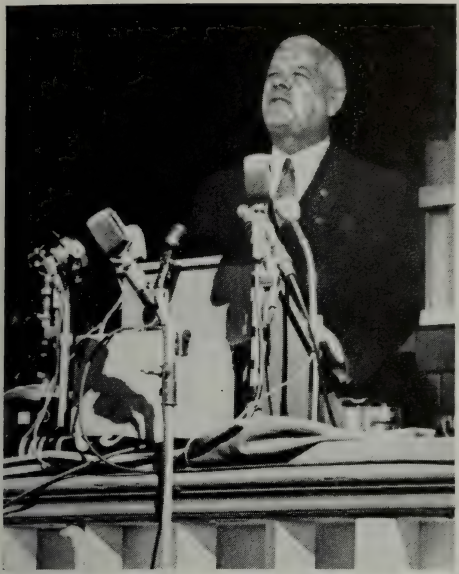
HISTORIC HEADLINES

Riots in South Korea . . . Six South Korean cities were declared to be in a "state of siege" on April 19 after mass riots had resulted in more than one hundred deaths. The demonstrators, mainly college and high-school students, were protesting illegal practices employed in the March 15 election. Opposition leaders charged that their party workers were physically attacked, both during the campaign and on election day, by followers of President Syngman Rhee. When the election results were in, it became apparent that the ballot boxes had been stuffed in favor of President Rhee's candidate for vice-president, Lee Ki Poong.

On the day of the riots, United States Secretary of State Herter informed the South Korean ambassador that the United States believed the demonstrations to be "a reflection of . . . repressive measures unsuited to a free democracy."

The Korean Cabinet resigned on April 21 in an effort to remove any stigma from President Rhee in connection with the election. Shortly thereafter, Vice-President John M. Chang, a member of the opposition party, also resigned. Syngman Rhee, who had been president of South Korea since its beginning, offered on April 26 to step down if the people wished it. That afternoon the National Assembly *demanded* it. On the following day his resignation was submitted and Foreign Minister Huh Chung became acting president. On April 28, Vice-President-elect Lee's older son, the adopted son of Syngman Rhee, shot his father, mother and brother, then turned the gun on himself.

. . . And in Turkey. The Grand National Assembly, on April 18, set up a commission to investigate the opposition Republican Party. The commission promptly banned all political activity in Turkey. Former President Ismet Inonu, leader of the Republicans, fought against the special commission until he was expelled from the Assembly for implying that Premier Adnan Menderes was a dictator. After Mr. Inonu's expulsion on April 27, the entire opposition walked out of the Assembly. The remaining deputies granted the commis-



UPI

South African Prime Minister Verwoerd defends apartheid policy prior to assassination attempt.

sion extraordinary powers, including the right to seize and shut down newspapers and to imprison those hampering its work.

Students in Istanbul rioted in protest. Martial law was declared in the large cities, and the Army fired on demonstrators. Some students were killed and about three thousand persons were arrested in Istanbul alone. At first, only schools, coffee shops and places of entertainment were closed, then a general twenty-four-hour curfew was declared.

The demonstrations formed a turbulent backdrop for the arrival of foreign ministers who would attend a NATO conference in Istanbul.

CHRONOLOGY OF EVENTS

1. **United Nations:** By a vote of nine to nothing, Britain and France abstaining, the Security Council deplored "the policies and actions of the Government of the Union of South Africa" that had "led to the loss of life of so many Africans." **France:** The Government exploded a second nuclear bomb in the Sahara. **United States:** Scientists launched Tiros I (Television and Infra-Red Observation Satellite I) from Cape Canaveral. Tiros promptly began to transmit photographs of the earth's cloud cover.

2. **France:** On the eve of Soviet Premier Khrushchev's return to Moscow, the Premier and President de Gaulle announced a policy of scientific co-operation, to include joint programs for the peaceful use of atomic energy.

4. **Japan:** Trade relations with South Korea, broken off in June 1959 over repatriation of North Koreans by Japan, were resumed. **France:** Arrangements were completed to grant independence to the Mali Federation, which is composed of Senegal and the Sudanese Republic. **United States:** the Mississippi broke through levees north and south of Meyer, Illinois, flooding thousands of acres of farmland.

5. **Switzerland:** At the Geneva disarmament talks, the West rejected the Soviet Union's chief proposals. **Great Britain:** French President de Gaulle arrived in London for a state visit.

6. **South Africa:** The Government announced that Africans were once again required to carry identity passes at all times. The pass laws had been suspended since March 26, 1960. **West Germany:** The Government formally protested Soviet Premier Khrushchev's statements in France that the "German aggressors" had revived fascism and constituted "a direct threat against peaceful life in Europe." **United States:** Colombia's President Alberto Lleras Camargo told a joint session of Congress that Latin America needs financial credit for development.

7. **France:** Clubs and tear gas were used against farmers who were demonstrating against Government farm policy. **Switzerland:** The Soviet Union turned down the West's disarmament plan.

8. **United Nations:** Secretary-General Hammarskjold stated that seizure at the Suez Canal of Israeli cargoes by the United Arab Republic violated United Nations principles. **Great Britain:** The House of Commons unanimously condemned South Africa's racial policies.

9. **South Africa:** David Pratt, a South African farmer of English extraction, shot Prime Minister Hendrik F. Verwoerd twice with a .22-caliber pistol. The Prime Minister was expected to recover. **Switzerland:** Fredrick M. Eaton, United States delegate to the disarmament talks, said that a recess of the conference from the end of April to June 6, 1960, had been agreed upon by all delegations. Mr. Eaton indicated that Secretary of State Herter's statement that the Soviet Union had urged the recess upon the West resulted from a misunderstanding.

11. **Cuba:** The American Ambassador in Havana informed the Cuban Government that increased tension in the Caribbean had forced the United States to stop shipping to the area items that might have a military potential.

PHOTOS, WIDE WORLD

President de Gaulle reviews the guard at Ottawa's National War Memorial.

APRIL (Cont.)

12. **Netherlands:** The International Court of Justice (World Court) ruled that India could keep Portuguese soldiers and arms from crossing Indian territory to reach Portuguese enclaves in India. **Algeria:** French Premier Debré said that, should a majority of Algerians wish independence from France, Algeria would be partitioned into a French section and an independent section.
13. **Great Britain:** The Government reported that it would not continue development of the still-untested Blue Streak missile for military purposes, but that the 2,800-mile-range rocket might be developed as a satellite-launching vehicle. **United States:** The Government launched Transit I-B, designed to test the possibility of using earth satellites as navigational aids.
14. **Switzerland:** At the Geneva nuclear-test-ban talks, the Soviet Union accepted a Western proposal for scientific meetings on the problem of detecting small underground nuclear explosions.
18. **Canada:** French President de Gaulle arrived in Ottawa at the start of a state visit. **Great Britain:** A crowd of about 75,000 people demonstrated, in London's Trafalgar Square, for unilateral nuclear disarmament for Britain. About 20,000 demonstrators had marched from Aldermaston, site of a British nuclear experimental station fifty-four miles from London. **Soviet Union:** The Government signed a three-year trade pact with Canada.
19. **India:** Communist China's Premier Chou En-lai was received coldly by crowds in New Delhi.
21. **United States:** Congress sent the Civil Rights Act of 1960 to the White House. It provides for enforcement of Federal court orders, Federal prosecution in cases of bombing or bomb threats, retention of Federal voting records for twenty-two months, public schools for children of the military where public schools are closed and a system of Federal referees to prevent a pattern of discrimination at the polls. Attorney General William P. Rogers announced Administration approval of the Act.
22. **United States:** French President de Gaulle was welcomed enthusiastically upon his arrival in Washington.
24. **Tunisia:** The Government charged France

with violations of Tunisian territory and airspace. President Habib Bourguiba declared, "Any new attack . . . will be considered an act of war . . . ."

25. India: A joint communiqué from Prime Minister Nehru and Communist China's Premier Chou revealed that their talks in New Delhi on border problems "did not result in resolving differences that had arisen." It was agreed that government officials would study the facts of the dispute in more detail. **United States:** French President de Gaulle, speaking before a joint session of Congress, said: "To destroy [nuclear] weapons by common consent, to enter the commitment not to manufacture any others, to open up all territories to reciprocal supervision, there is no other hope for the future of our species . . . But we have reached the last moment when an agreement seems possible."

26. Japan: More than 200 rallies and demonstrations, including one by 70,000 people in Tokyo, protested the still-unratified Japan–United States security treaty.

27. Togo: Premier Sylvanus Olympio proclaimed Togo's independence. Formerly the country was the French-administered United Nations trust territory of Togoland.

29. Italy: Premier Fernando Tambroni and his Cabinet received a vote of confidence from the Senate, ending a two-months' crisis.

30. South Vietnam: A group of prominent Vietnamese charged the Government of President Ngo Dinh Diem with "dictatorial" methods and requested permission to form an opposition political party.

● ● ●

MAY

HISTORIC HEADLINES

The U-2 Incident. Soviet Premier Khrushchev stated on May 5 that on May Day a United States plane was shot down over Soviet territory. The United States National Aeronautics and Space Administration implied that a U-2 weather-research plane might have strayed over the Soviet border. Premier Khrushchev said on May 7 that the pilot had been captured and had revealed himself as a spy. The State Department admitted that the U-2 had "probably" been on a mission of espionage. Two days later, Secretary of State Herter stated that the President had authorized the espionage program.

When the big four met in Paris on May 16, an angry and insulting Premier Khrushchev used the U-2 incident as an excuse to withdraw from the conference. President Eisenhower announced that the United States would make no more spy flights, but the Premier was not mollified and no regular session of the summit meeting was held.

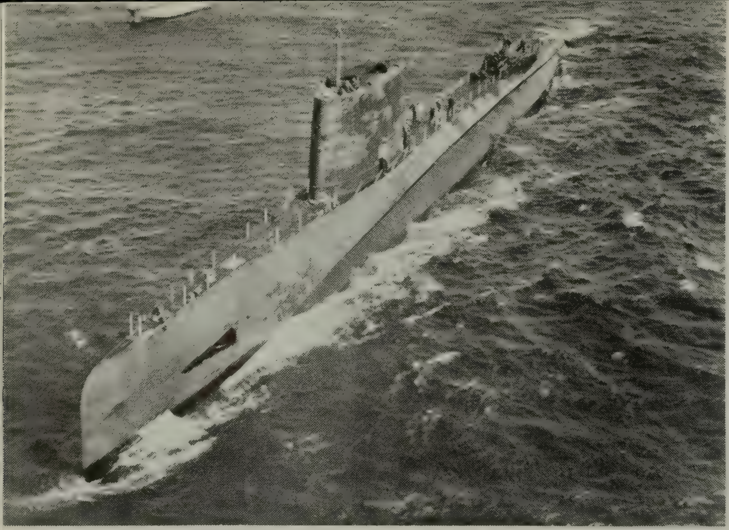
On May 18 the Soviet Union requested a United Nations Security Council meeting. At the opening session the Soviets presented a resolution asking the Council to condemn the American flights as aggressive. United States Ambassador Henry Cabot Lodge told the Council of recent Soviet spying in the United States. Later he said that the United States would present a new "open skies" proposal to the General Assembly. The Soviet resolution, after some debate, was not passed.

On May 30, Soviet Defense Minister Rodion Y. Malinovsky announced that he had ordered Soviet forces to rain rockets upon bases from which planes take off to violate the territory of the U.S.S.R. or its allies.

Army Take-Over in Turkey. Student demonstrations that began in April in protest against dictatorial practices by Turkish Premier Adnan Menderes continued into May despite a Government announcement on May 1 that the Army would open fire on demonstrators. Although troops quickly dispersed crowds of students and other protesting groups, they did not resort to gunfire. On May 22, new regulations tightened the martial law governing Ankara and Istanbul. It was announced that colleges and universities, closed during April, would not reopen until after martial law had been lifted.

The armed forces, headed by Lieutenant General Cemal Gursel, took control of the country on May 27, arresting Premier Men-

Ambassador Lodge, left, holds the microphone hidden by Soviet agents in a replica of the Great Seal given to the American ambassador in Moscow.



WIDE WORLD

The United States nuclear submarine Triton rides the surface of the Atlantic off the Delaware coast after completing her history-making underwater trip around the globe.

deres, other members of the Government, and high-ranking military men. Liberalizing measures were quickly announced.

CHRONOLOGY OF EVENTS

2. **United States:** Caryl Chessman, who had been reprieved eight times, was finally executed at San Quentin Prison. . . . C. Douglas Dillon, undersecretary of state, asked the Senate not to pass an amendment to the foreign-aid bill giving the President power to withhold aid to the United Arab Republic. The Senate, however, included the amendment in the bill as passed.
3. **Switzerland:** At the Geneva nuclear-test-ban talks, the Soviet Union accepted the West's proposal to use experimental nuclear explosions in testing detection systems. **United Nations:** France protested that Tunisia was permitting Algerian troops to attack French forces in Algeria from Tunisian bases.
4. **United States:** Secretary of Health, Education, and Welfare Arthur S. Flemming released the Administration plan for medical care of the aged. The cost of the plan in excess of the amount provided by the $24 annual fee for members (not required for people on relief) would be shared by the Federal Government and the states; eligible persons over sixty-five could choose either participation in the plan or private medical insurance partially financed by the Government. . . . The Government agreed to sell to India $1,276,000,000 worth of surplus grain.
5. **Soviet Union:** The membership of top Government bodies underwent several changes. Among other shifts, Frol R. Kozlov was dropped as a first deputy premier and named to the secretariat of the Communist Party's Central Committee. Aleksei N. Kosygin became a first deputy premier. **Great Britain:** Colonial Secretary Iain Macleod announced that British Somaliland would be granted independence by July 1, 1960.
6. **Indonesia:** Students in Jakarta protested Dutch plans to strengthen military forces in Netherlands New Guinea. **Great Britain:** Princess Margaret Rose married Antony Armstrong-Jones, a commoner, in Westminster Abbey. **United States:** After receiving a State Department promise to increase its diplomatic efforts to safeguard American sailors against Arab discrimination, the Seafarers International Union halted the four-week-old picketing of the United Arab Republic ship Cleopatra.
7. **Soviet Union:** Marshal Kliment Y. Voroshilov resigned as chairman of the Presidium of the Supreme Soviet, the office of chief of state that is usually termed "president" in the West. Leonid I. Brezhnev was named to succeed him. **United States:** The White House announced that President Eisenhower had authorized a series of underground conventional and nuclear explosions as part of an effort to improve detection methods.
8. **Panama:** Dr. Roberto F. Chiari was elected president.
9. **United States:** Attorney General William P. Rogers, invoking the Civil Rights Act of 1960, asked four Southern counties to produce their voting records. In each county the majority of citizens of voting age are Negroes, none of whom were registered at the polls.
10. **United States:** The nuclear submarine Triton completed circling the globe in eighty-four days, largely following the route of Ferdinand Magellan. The Triton surfaced only twice, once to discharge an ill crew member and once for a ceremony commemorating Magel-

lan's trip. . . . Senator John F. Kennedy defeated Senator Hubert Humphrey in the West Virginia presidential primary. Senator Humphrey then withdrew from the race for the Democratic presidential nomination.

11. **Switzerland:** The Government ordered two officials of the Soviet Embassy in Bern to leave the country. The Russians were accused of espionage. **United States:** President Eisenhower stated that the new series of nuclear explosions would be carried out with the co-operation of Great Britain and the Soviet Union.

13. **United States:** President Eisenhower vetoed a $251,000,000 bill for Federal aid to economically depressed areas. . . . Former President Harry S. Truman announced that he would support Senator Stuart Symington for the Democratic nomination for president.

15. **Soviet Union:** The Government launched a satellite weighing nearly five tons, containing a dummy space man and equipment to make possible human survival in space.

16. **United States:** The nation's military commands staged a world-wide combat alert on orders from Defense Secretary Thomas S. Gates, Jr., who was in Paris for the summit meeting.

19. **Portugal:** President Eisenhower was warmly received in Lisbon.

20. **Japan:** The House of Representatives approved the Japan–United States security treaty as a step toward ratification. Thousands opposed to the treaty demonstrated outside the Diet (Parliament) building as the vote was taken. **East Germany:** It was announced that an American C-47 with nine aboard had made a forced landing near the small town of Klütz near the border of East and West Germany. . . . Speaking in East Berlin, Soviet Premier Khrushchev said that no peace treaty with East Germany would be signed before the next summit meeting. **United States:** An Atlas missile was fired from Cape Canaveral, Florida, to a target area in the Indian Ocean. The 9,000-mile flight was the longest missile-shot on record, more than 1,000 miles longer than the Soviet flights in January 1960.

21. **Chile:** An earthquake rocked the area surrounding Concepcion.

23. **Israel:** Premier David Ben-Gurion announced that Adolf Eichmann had been arrested and was being held in custody. The Nazi leader was charged with the execution of six million Jews during World War II. **United States:** Tidal waves (tsunamis), caused by a series of Chilean earthquakes, struck Hawaii, causing extensive damage and loss of life in Hilo.

24. **East Germany:** The Soviet Army agreed to release the C-47 and nine Americans forced down by fighter planes on May 20. **United Arab Republic:** Four major newspaper and magazine publishing houses were removed from private ownership. With this step, most of the press came under Government control. **Japan:** Tidal waves killed about one hundred persons. **United States:** The Air Force launched Midas II from Cape Canaveral. This satellite was developed to track missiles by detecting the infrared waves given off by rocket exhausts.

25. **Chile:** Continued earthquakes, volcanic activity and tidal waves raised the toll of dead and missing to an estimated 5,000. About 2,000,000 Chileans were believed to be homeless. **Canada:** Commissioner C. W. Harvison of the Royal Canadian Mounted Police revealed that 11,000 Chinese had been smuggled into Canada over a ten-year period. **United States:** New York's Governor Nelson Rockefeller declared that he would not refuse a draft for Republican nominee for president.

26. **Japan:** An estimated 2,000,000 demonstrators throughout the country protested forthcoming final ratification of the Japan–United States security treaty. **United States:** The Air Force reported that a malfunction in communication had destroyed the missile-detection capabilities of Midas II.

• • •

JUNE

HISTORIC HEADLINES

Eisenhower Visit to Japan Cancelled. In Japan anti-American riots and demonstrations against the Japan–United States security treaty and the Government of Premier Nobusuke Kishi continued into June. On June 6 the Japanese Socialist Party demanded that President Eisenhower cancel his trip to Japan. Several United States Senators also suggested that, in view of the possible dangers, the visit should be postponed, but the White House announced that there would be no change in plans.

The security treaty, then about to be ratified, replaces a previous treaty imposed upon Japan during the American occupation. The new pact guarantees United States aid if Japan is attacked. Opponents of the treaty, supported by the Communists, wanted to eliminate United States bases from the islands and to adopt a neutralist policy for Japan.

On the day before President Eisenhower was due to leave, an advance party—White House Press Secretary James Hagerty, Ambassador Douglas MacArthur II, and Presidential Appointments Secretary Thomas E. Stephens—was besieged near the Tokyo airport by an estimated six thousand demonstrators. The three men were rescued by helicopter. President Eisenhower, however, began his journey on June 12 as originally scheduled.

About twenty thousand Japanese rioters stormed the Diet (Parliament) on June 15. The next day, in view of the disturbances, the Cabinet decided to ask the President not to visit Japan. Newspapers the world over described the cancellation as a serious blow to the prestige of the President and the United States.

Despite the omission of Japan from his itinerary, the President reported to the American people on his return that the Far Eastern trip had succeeded in many ways. He received enthusiastic welcomes in the Philippines, Taiwan and Korea and only on Okinawa were there anti-American demonstrations.

Most observers believed, in spite of the riots, that the Japanese people as a whole stood behind Premier Kishi and the security pact. Ratification of the treaty was completed on June 23. Premier Kishi on that day announced that he would resign.

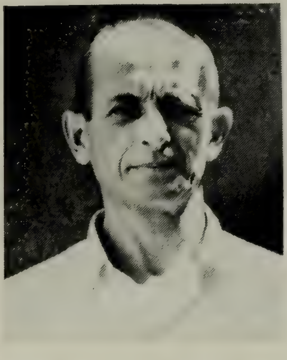
CHRONOLOGY OF EVENTS

2. **United Nations:** A revised Soviet plan for "total" disarmament was released by the United Nations. In it were included several Western ideas about control programs and steps toward "total" disarmament.
4. **Taiwan:** Disregarding a pledge to bombard the offshore islands on odd-numbered days only, Communist China heavily shelled Quemoy.
5. **Bolivia:** Victor Paz Estenssoro, president from 1952 to 1956, was again elected to that office.

The first oil refinery to be seized by the Cuban Government for refusal to process Soviet crude oil was the American-owned Texaco plant.

PHOTOS, WIDE WORLD

Presidential Press Secretary James Hagerty, in car with man on roof, is hemmed in by thousands of Japanese. He was rescued by helicopter.



Adolf Eichmann, accused Nazi executioner of Jews in World War II, was abducted from Argentina for trial in Israel.

United States: Canadian Prime Minister John Diefenbaker, speaking at DePauw University, called for an early meeting of NATO heads of state to discuss East-West relations.

6. **Ecuador:** Former President Jose M. Velasco Ibarra, running as an independent, became president for a fourth term. **Argentina:** The Israeli Government informed Argentina that former Nazi leader Adolf Eichmann had left Argentina willingly. Israel apologized for any violations of Argentine law or sovereignty by volunteers who took Eichmann to Israel.

7. **United States:** A Bomarc ground-to-air missile, armed with a nuclear warhead, burned and exploded at its launching site in New Jersey. Although this was not a nuclear explosion, it released a certain amount of radiation into the immediate area. There were no casualties.

8. **Argentina:** The Government demanded that Israel return Adolf Eichmann. **United States:** The Inter-American Peace Committee of the Organization of American States accused the Dominican Republic of increasing international tensions in the Caribbean area through violations of human rights and basic freedoms. **Canada:** Saskatchewan voters gave the Co-operative Commonwealth Federation, a socialist party, control of the provincial government for the fifth straight time.

10. **United States:** The United States Court of Appeals ruled that the Atomic Energy Commission could not complete a nuclear power station thirty miles from Detroit, Michigan, until more knowledge was available about potential hazards to the people in the area.

12. **Soviet Union:** *Pravda,* official newspaper of the Soviet Communist Party, denounced "leftist" critics of Premier Khrushchev's doctrine of peaceful coexistence with capitalism. Informed observers said that the critics to whom *Pravda* referred were the leaders of Communist China.

14. **France:** President de Gaulle again offered to meet Algerian rebel leaders in Paris.

15. **United Nations:** Argentina asked the Security Council to discuss the Adolf Eichmann matter. **South Korea:** The National Assembly amended the Constitution, transferring the Government's executive power to a premier and cabinet, as in the British parliamentary system.

16. **United States:** Congress passed the twenty-third amendment to the Constitution, which would grant to residents of the District of Columbia the right to vote in presidential elections. The amendment will go into effect only if ratified by thirty-eight states within seven years.

20. **Tunisia:** The Provisional Government of the Algerian Republic, representing the group of Algerian nationalists who have been fighting the French for nearly six years, agreed to send Premier Ferhat Abbas to Paris to meet President de Gaulle. **United States:** Former world-heavyweight-boxing champion Floyd Patterson regained the title by knocking out Sweden's Ingemar Johansson in the fifth round of a scheduled fifteen-round match.

21. **United States:** Nobel Prize-winner Linus Pauling declined to reveal to the Senate Internal Security Subcommittee the names of scientists who had worked with him for a nuclear-test ban.

22. **Canada:** The Liberal Party captured control of Quebec's provincial government. For sixteen uninterrupted years, Quebec had been ruled by the National Union Party. **United States:** The Air Force launched two Navy satellites with one rocket. In one satellite, Transit II-A, a radio receiver designed and built by Canadian scientists was installed. The shot thus achieved two firsts—the launching of two instrumented satellites with one rocket, and international co-operation on satellite manufacture.

23. **United Nations:** The Security Council passed by a vote of eight to zero an Argentine resolution demanding "appropriate reparation" from Israel for violations of sovereignty in the Adolf Eichmann arrest. United States Ambassador Henry Cabot Lodge suggested that Israel's apology and the passage of the resolution could be considered sufficient reparation.

25. **France:** Representatives of the Algerian Provisional Government arrived in Paris for preliminary talks toward a meeting between President de Gaulle and Premier Abbas. **United States:** The Senate Foreign Relations Committee charged the Administration with mishandling of the U-2 incident in May 1960. **Pakistan:** President Mohammad Ayub Khan expressed grave doubts about the ability of the United States Government to act swiftly in a military emergency.

26. **Somaliland:** Independence was granted by Great Britain. **Malagasy:** The Malagasy Republic (Madagascar) was proclaimed independent of France.

27. **Switzerland:** Delegates from communist countries walked out on the forty-seventh session of the ten-nation disarmament talks in Geneva. The five communist representatives indicated that they would not return to the talks but would take the Soviet disarmament plan to the United Nations. The walkout oc-

curred as the United States was preparing to introduce a set of new proposals. **Rumania:** The communist parties of the iron- and bamboo-curtain countries declared themselves in favor of peaceful coexistence between East and West. Previous to the declaration many observers had noted a rift between the Soviet Union and Communist China on this question. **United States:** The Supreme Court held that Federal courts could not admit evidence obtained by state officials in violation of Constitutional sanctions. The five-to-four ruling upset a unanimous court decision of 1914.

28. **Nepal:** The Foreign Office announced receipt of a note from Communist China revealing a new revolt by Tibetan peasants.

29. **Cuba:** The Government seized the American-owned Texas Company oil refinery for refusing to process petroleum from the Soviet Union. **United States:** The State Department submitted to the Inter-American Peace Committee a detailed memorandum accusing Cuba of raising tension in the Caribbean area through propaganda attacks on the United States.

30. **The Republic of the Congo:** Belgian King Baudouin formally proclaimed the independence of the former Belgian Congo. **Austria:** Soviet Premier Khrushchev received an extremely cool reception from the Austrian people upon his arrival in Vienna at the start of an official visit. **United States:** President Eisenhower vetoed a bill to provide wage increases for Federal employees, saying that pressure from the postal lobby had been instrumental in the bill's passage. . . . The fiscal year ended with the budget showing a surplus of nearly $500,000,000, the first surplus in three years.

• • •

JULY

HISTORIC HEADLINES

Crisis in the Congo. Before the Republic of the Congo was a week old, it was in serious trouble. Congolese troops mutinied against their Belgian officers and began to attack Europeans in all sections of the nation. (Many Belgians had remained in the Congo to carry responsibilities for which Congolese had not been trained.) An alarmed Belgium started sending paratroopers to the Congo on July 8 to protect its 80,000 nationals in the former colony. On July 11, Premier Moise Tshombe of rich Katanga Province, which supplies about 60 per cent of the Congo's wealth, declared Katanga independent of the Republic. The next day the Congo's Premier Patrice Lumumba appealed to the United Nations for help.

United Nations Secretary-General Dag Hammarskjold asked the Security Council to set up a United Nations force in the new republic. By a vote of eight to zero (Britain, France and Nationalist China abstaining), the Council approved the formation of such a force and asked the Belgian troops to leave the Congo. The first United Nations soldiers, drawn mainly from independent African states, began to arrive on July 15.

Periodically during the month, Premier Lumumba announced that he would ask communist armies to rout the Belgian troops. These troops began evacuation of some areas on July 20, although the Security Council felt it necessary two days later to insist that they "speedily" withdraw. Belgian troops and nationals then concentrated in Katanga, where secessionist Premier Tshombe announced that his Congolese troops would fight to keep the United Nations force out. Meanwhile, despite efforts by the United States, the Soviet Union and other nations to supply food and medical assistance, problems of nutrition and health in the Congo steadily worsened.

Economic War between Cuba and the United States? On the first day of the month, Cuba completed seizure of foreign-owned oil refineries, including two owned by American companies. The United States Congress quickly acted to enable President Eisenhower to adjust sugar quotas. On July 6 the President reduced the Cuban quota by about 95 per cent.

Premier Khrushchev, on July 9, declared, "If need be, Soviet artillerymen can support the Cuban people with their rocket fire. . . . This, if you want, is a warning . . ." President Eisenhower immediately invoked the Monroe Doctrine and inter-American pacts that supplement it. Premier Khrushchev offered to purchase Cuba's sugar and declared the Monroe Doctrine was dead. The United States State Department warned the Premier not to intervene in United States–Cuban relations.

On July 16 the United States protested that Cuba's Nationalization Law—which applied to the property of American nationals only—was "economic and political aggression. . . ." Called into session by Cuba, the

Security Council of the United Nations heard Cuba's Foreign Minister Raul Roa charge the United States with "economic war." The Security Council decided to turn the matter over to the Organization of American States. The Soviet Union, which warned "Do not touch Cuba," abstained on the vote, as did Poland.

The RB-47 Incident. A United States RB-47 reconnaissance plane on a magnetic-field mapping mission over Arctic waters vanished on July 1. After a ten-day search, in which the Soviet Union participated, the Russians announced that a fighter plane had downed the reconnaissance plane "over Soviet territorial waters." Two members of the six-man crew were held as spies and the body of one was returned to the United States. The other three were missing and presumed dead. The Soviet Union and the United States quickly exchanged notes of protest; the United States claimed that the RB-47 was about thirty miles from land at all times and had been instructed to keep away from Soviet territory and airspace.

On July 22, Soviet First Deputy Foreign Minister Vasily V. Kuznetsov asked the United Nations Security Council to condemn the United States for the flight. The United States proposed that an impartial inquiry board be set up to investigate the whole affair or, alternately, that it be tried by the International Court of Justice. This resolution was vetoed by the Soviets. The Soviet resolution to condemn the United States was rejected nine to two.

CHRONOLOGY OF EVENTS

1. **Somalia:** Italian Somaliland, a United Nations trust territory, became the independent Republic of Somalia. Five-day-old Somaliland—formerly British Somaliland—immediately united with the new republic. **United States:** Congress overrode the Presidential veto of a pay rise for about 1,500,000 Federal employees.
4. **Tunisia:** The Provisional Government of Algeria, which has headquarters in Tunis, announced that, for the time being, French demands ruled out negotiations toward ending the Algerian War.
5. **Canada:** Jean Lesage, of the Liberal Party, became premier of Quebec.
7. **Italy:** Strikers, protesting the halting by police of a communist-led demonstration, were fired upon by the police in the city of Reggio Emilia. Five persons were killed and about 20 wounded.
8. **Italy:** Communist demonstrations in Sicily resulted in the death of 3 rioters and injury to about 100 rioters and police.
12. **Canada:** The Canada–United States Ministerial Committee on Joint Defense opened talks to explore the possibility of making United States nuclear weapons available to Canada's armed forces.
13. **United States:** Senator John F. Kennedy was named Democratic nominee for president.
14. **United States:** The Democratic National Convention nominated Senator Lyndon B. Johnson for vice-president. **Japan:** Outgoing Premier Kishi was stabbed in the leg by a member of the Right Wing of the Liberal-Democratic Party; he was expected to recover.
19. **Italy:** As a result of rioting earlier, Premier Fernando Tambroni and his Cabinet resigned. **Japan:** Hayato Ikeda became premier.
20. **United States:** The nuclear submarine George Washington successfully fired two Polaris intermediate-range ballistic missiles while submerged off Cape Canaveral. The underwater launching was expected to lead to operational Polaris-armed submarines by autumn of 1960.

Jean Lesage, member of the Liberal Party, who was inaugurated premier of the province of Quebec.

STUDIO ROGER BEDARD

Mrs. Sirimavo Bandaranaike, the world's first woman prime minister, speaks at a Colombo, Ceylon, rally.

DE ALWIS

21. **Ceylon:** Sirimavo Bandaranaike, widow of Prime Minister S. W. R. D. Bandaranaike who was assassinated in 1959, became the world's first woman prime minister.
22. **Argentina:** The Government declared the Israeli ambassador *persona non grata* in retaliation for the kidnaping of Adolf Eichmann from Argentine soil. **United States:** The Government expelled Soviet diplomat Pyotor Y. Yezhov, accusing him of obtaining aerial photographs of strategic target areas in the United States.
23. **Cuba:** A five-year trade agreement was signed between Cuba and Communist China. Under the terms of the pact, China would purchase 500,000 tons of Cuban sugar annually. **Spain:** It was reported that Czechoslovak civil aircraft had been trying to fly over United States–Spanish bases in Spain.
24. **Soviet Union:** Tass announced that Marshal Grechko had replaced Marshal Konev as military head of the Warsaw Pact.
25. **Southern Rhodesia:** Rioters in Bulawayo, protesting the arrest of political leaders and the banning of a political meeting, set fire to buildings and automobiles and ran wild through the streets. Police killed three Africans and injured about seventy-five. **United States:** Variety-store lunch counters were desegregated in Greensboro, North Carolina. A drive to desegregate eating places through sit-in demonstrations had started in Greensboro on February 1, 1960.
26. **United Arab Republic:** President Nasser expelled the Iranian Ambassador on the grounds that Iran, ten years before, had recognized Israel. Iran gave Israel *de facto* recognition in 1950 but had taken no other steps toward full recognition. **Switzerland:** At the nuclear-test-ban talks in Geneva the Soviet Union suggested that three annual on-the-site inspections would be a reasonable number. The West had previously suggested a quota of twenty annual inspections. **Southern Rhodesia:** Riots continued in Bulawayo, bringing the total number of Africans killed to twelve.
27. **United States:** The Republicans selected Vice-President Richard M. Nixon as their nominee for president. **Iran:** The Government broke off diplomatic relations with the United Arab Republic. **Great Britain:** Prime Minister Macmillan reshuffled his Cabinet, making a number of changes. The Earl of Home became foreign secretary, and Selwyn Lloyd was named chancellor of the exchequer.
28. **United States:** United Nations Ambassador Henry Cabot Lodge was nominated by the Republicans for vice-president. **United Arab Republic:** The Arab League announced that it would extend its economic boycott of Israel to include Iran.
29. **South Korea:** Some rioting and violence marked South Korea's general elections. The Democratic Party, opponent of former President Syngman Rhee, won a clear-cut majority in the legislature. **Ghana:** The Government announced that, as of August 1, South African goods would be boycotted and South African citizens who did not declare their opposition to apartheid excluded. The new policy was timed to coincide with the start of a similar boycott by Malaya.

• • •

AUGUST

HISTORIC HEADLINES

OAS Meets in San Jose. At the conference of foreign ministers of the Organization of American States in San Jose, Costa Rica, on August 17, Venezuela charged the Dominican Republic with the attempted assassination of Venezuelan President Romulo Betancourt. On August 20 all OAS nations that had not already done so agreed to break diplomatic ties with the Dominican Republic. The conference also instituted partial economic sanctions against the republic, beginning with an arms embargo.

The ministers next took up the question of subversion and threats from outside the hemisphere. Cuba alone had opposed inclusion of this item on the agenda. The United States had charged that Cuba was in "open league with the Soviet Union and Communist China." In Cuba, Manuel Cardinal Arteaga and eight archbishops of the Roman Catholic Church had also expressed their fear that the island was drifting toward communism. On August 28 the OAS approved the Declaration of San Jose, condemning Sino-Soviet intervention in Western Hemisphere affairs. The foreign ministers of Venezuela and Peru (who personally supported the revolutionary Government in Cuba) refused to sign the document. Members of their delegations, however, did sign to indicate the approval of their Governments.

Congo Strife Continues. In August the Republic of the Congo split for the second time (Katanga Province had seceded early in July). Premier Patrice Lumumba's policies fluctuated from one extreme to another and the Soviet Union continued its attempts to turn the crisis to its own advantage. The United Nations policy of nonintervention in domestic affairs became more difficult to hold.

On August 2 Secretary-General Hammarskjold announced that the United Nations would move into Katanga Province. When Katanga's President Moise Tshombe declared that his army would oppose the move, the plan was dropped. On August 9 the Security Council declared that entry of the United Nations forces into Katanga was a necessity. Later that day President Tshombe said that he would permit the entry, provided that the troops were not drawn from communist nations, or from Guinea or Ghana. The Secretary-General entered the province on August 12 with Swedish forces.

Premier Lumumba objected to the use of non-African troops in Katanga. He complained that the United Nations was not consulting his Government and that Belgian spies were infiltrating the United Nations forces. As relations between Lumumba and Secretary-General Hammarskjold deteriorated, the Secretary-General called another meeting of the Security Council for August 22. By giving him no further instructions, the Council tacitly supported his actions.

By then, Lumumba's spy charges had begun to take effect. On August 18, eight Canadians were beaten by Congolese soldiers. Eight Americans, two more Canadians and a Swede were attacked on August 27. In each case the Congolese believed the United Nations personnel to be Belgian spies.

Other troubles plagued the Lumumba regime. In the Congo's Kasai Province, an opposition party announced secession of a huge area. Lumumba sent troops to deal with these new rebels. The Belgian Army, because of transportation difficulties, was not evacuated by its August 29 deadline. Finally, a conference of African governments called by Lumumba bluntly told the Premier that it supported the United Nations and that attacks upon the world organization must cease.

CHRONOLOGY OF EVENTS

1. **Dahomey:** Independence from France was granted. **United Nations:** The Soviet Union stated its opposition to a United States proposal that the eighty-two-nation Disarmament Commission meet in August. The Soviet note suggested that the heads of all governments

Captain Kong Le, leader of the rebels who seized Vientiane, Laos.

A Ghana policeman, member of the UN forces in the Congo, helps to keep Leopoldville crowds in order.

UN Secretary-General Hammarskjold (right) and Katanga Premier Tshombe (center) in Elisabethville.

PHOTOS THIS PAGE. WIDE WORLD

belonging to the United Nations should attend the General Assembly in September and deal with disarmament there.

3. **Niger Republic:** The republic became independent.

4. **United States:** The X-15 rocket plane, piloted by Joseph A. Walker, set a new speed record for manned flight—2,196 miles per hour.

5. **Voltaic Republic:** President Maurice Yemeogo officially declared the nation's independence from France.

7. **Ivory Coast:** Independence from France was proclaimed.

9. **Laos:** A group of rebels, led by Captain Kong Le, took over the administrative capital, Vientiane, and proclaimed a foreign policy of strict neutrality, although the Government still remained in power in Luang Prabang.

10. **United States:** The Senate approved a twelve-nation treaty providing for international scientific co-operation in Antarctica. The pact also prohibited military use of the continent and guaranteed the inspection rights necessary to police this provision. The Soviet Union was a signatory.

11. **Chad:** The nation received its independence from France. **United States:** A capsule from satellite Discoverer XIII was retrieved from the Pacific Ocean. It was the first object known to have been recovered from an orbiting satellite.

12. **United States:** The X-15 flew to a record height of 131,000 feet, or nearly twenty-five miles. . . . The Government launched Echo I, a giant balloon satellite intended for communications purposes. A radio message from President Eisenhower was reflected from the balloon and traveled about 2,400 miles.

13. **Central African Republic:** The nation, formerly known as Ubangi-Shari, was declared independent from France.

14. **Laos:** Following a vote of no confidence from the National Assembly, the Government resigned.

15. **Congo Republic:** President Fulbert Youlou proclaimed that the nation, formerly known as the Middle Congo, had become independent from France.

16. **Cyprus:** Cypriote, British, Greek and Turkish leaders signed documents granting independence to Cyprus, a former British crown colony. **United Nations:** At a meeting of the Disarmament Commission, the United States proposed that it and the Soviet Union each contribute 66,000 pounds of weapons-grade uranium for peaceful purposes. The United States also offered to shut down, one by one, plants producing fissionable material for weapons, provided that the Soviets would also do so. **United States:** Air Force Captain Joseph W. Kittinger, Jr., set new records for highest flight in a balloon, highest flight in an open-gondola balloon, longest parachute jump and longest free fall. Captain Kittinger leaped from the balloon at an altitude of nearly twenty miles.

17. **Soviet Union:** U-2 pilot Francis Gary Powers pleaded guilty to an indictment charging him with spying for the United States. **Indonesia:** President Sukarno announced that his Government had severed relations with the Netherlands. Indonesia claimed that the Dutch should relinquish Netherlands New Guinea. **Laos:** Rebel leader Captain Kong Le announced that he had turned over conduct of the Government to Prince Souvanna Phouma. Former Defense Minister Major General Phoumi Nosavan declared that he had formed a committee to overthrow the new Government. **Gabon:** The nation became independent.

19. **United States:** The Air Force caught Discoverer XIV satellite's capsule in mid-air, 8,500 feet above the Pacific Ocean. **Soviet Union:** The Government launched a satellite containing two dogs and other living things. . . . The Government declared U-2 pilot Powers guilty of espionage and sentenced him to ten years loss of liberty, the first three to be spent in prison.

20. **Mali:** Senegal withdrew from the Mali Federation after Mali's Premier Modibo Keita, who was also premier of the Sudanese Republic, took away almost all of Deputy Premier Mamadou Dia's official powers. Mr. Dia was premier of Senegal as well as deputy premier of the Federation. **Soviet Union:** The satellite launched August 19 safely returned to the ground its cargo of dogs, mice, rats, flies, seeds and plants.

22. **United States:** Congress passed a bill suspending radio and television requirements for equal time for candidates from all parties. The suspension was for the 1960 presidential campaign only.

24. **United States:** The Government approved certain types of live-virus polio vaccines.

25. **Mali:** Premier Modibo Keita announced that he had asked the United Nations to settle the question of Senegal's withdrawal from the Mali Federation.

27. **United States:** Riots between Negroes and white people in Jacksonville, Florida, resulted in about fifty injuries and one death.

29. **Jordan:** Time bombs killed Premier Hazza

Majali and eleven others, and injured about eighty-five persons. **Iran:** Premier Manouchehr Eghbal's resignation was accepted by the Shah. Dr. Eghbal's party had been accused of rigging national elections. **Laos:** King Savang Vathana asked neutralist Souvanna Phouma to form a government, thus legalizing the new regime.

30. **East Germany:** The Government announced that it would not grant West Germans access to West Berlin to attend a rally to be held there of refugees from Eastern Germany.

31. **West Berlin:** The Allied Command protested to the Soviets that the East German ban on travel to West Berlin was a direct contravention of rights guaranteed in 1949. **United States:** Congress authorized $65,000,000 in supplemental foreign-aid funds for defense purposes. It also cleared the way for $500,000,000 in economic aid to Latin American countries and $100,000,000 in aid to earthquake-damaged Chile.

● ● ●

SEPTEMBER

HISTORIC HEADLINES

World Leaders at UN General Assembly. On September 1, Premier Khrushchev's decision to head the Soviet delegation at the fifteenth United Nations General Assembly in New York was announced. He called for all heads of government to attend. By the end of the month the prime ministers of Canada and the United Kingdom, the neutralist leaders Nasser, Nehru, Nkrumah, Olympio, Sukarno and Tito, as well as Cuban Premier Castro and leaders of communist countries that are United Nations members, had appeared.

To minimize security risks the American Government restricted Premier Khrushchev, Hungarian Minister of State Janos Kadar, Albanian Premier Mehmet Shehu and Premier Castro to Manhattan. The Soviet Union protested and Premier Khrushchev was permitted to week-end at the Soviet estate on Long Island. The United States also advised television networks that the national interest would not be served by special programs featuring Premier Khrushchev. Before the General Assembly convened on September 20, Premier Khrushchev paid a brief visit to the Cuban Premier at his Harlem hotel.

At the opening session, the Assembly elected Frederick H. Boland of Ireland president and admitted fourteen new members. Later in the month they added two more new states, bringing total membership to ninety-eight.

In a speech before the Assembly on September 22, President Eisenhower firmly committed the United States to work through the United Nations for peace. He outlined a program to insure continued independence and stability for young African states, asked the nations to set aside troops and equipment for potential UN military use, and suggested international co-operation in outer space along the lines of the Antarctic treaty.

The next day Premier Khrushchev demanded immediate freedom for all colonies. He denounced Secretary-General Hammarskjold and called for replacement of the office of secretary-general by a three-man committee representing the Western, communist and neutralist blocs. He later indicated that he wanted veto powers for each bloc. The Secretary-General had angered the Soviets by his attitude in the Congo dispute.

On September 26 the Secretary-General replied, saying that he would rather see the office of secretary-general "break on strict adherence to the principle of independence, impartiality and objectivity than drift on the basis of compromise."

In an effort to improve relations between the great powers, the leaders of Ghana, India, Indonesia, the United Arab Republic and Yugoslavia, on September 30, introduced a resolution asking President Eisenhower and Premier Khrushchev to meet.

SOVFOTO

American defectors Martin and Mitchell (behind signs) in Moscow.

WIDE WORLD

Hurricane Donna lashes at a schooner heading for a sea wall at Boston.

SEPTEMBER (Cont.)

CHRONOLOGY OF EVENTS

4. **Finland:** Premier Khrushchev offered to revise Finnish-Soviet trade agreements so that Finland could join the European Free Trade Association (Outer Seven) as an associate member.

5. **France:** President de Gaulle indicated that France would ignore any United Nations resolution on Algeria. **The Republic of the Congo:** President Joseph Kasavubu replaced Premier Patrice Lumumba with Joseph Ileo. Mr. Lumumba declared the action illegal.

6. **Soviet Union:** William H. Martin and Bernon F. Mitchell, code decipherers for the United States National Security Agency, announced in Moscow that they had defected. **The Republic of the Congo:** Deposed Premier Lumumba declared President Kasavubu deprived of power. The United Nations, acting on an appeal from President Kasavubu, took control of the Leopoldville radio station and all important airports.

7. **United States:** President Eisenhower said, "The United States deplores the unilateral actions of the Soviet Union in supplying aircraft and other equipment for military purposes to the Congo."

8. **East Germany:** The Government announced that West Germans would require passes from East Germany to enter East Berlin. **United Nations:** Secretary-General Hammarskjold sent a note to Belgium requesting an explanation of alleged Belgian arms shipments to the Congo.

10. **West Berlin:** The Allied Command announced that it would refuse travel permits to some East Germans in retaliation against new travel restrictions on West Germans. **The Republic of the Congo:** The United Nations declared a cease-fire along the Katanga border. It also paid Congolese troops in Leopoldville and persuaded them to lay down their weapons. **Soviet Union:** The Government informed the United Nations that it would continue to provide military equipment for deposed Congolese Premier Lumumba.

11. **Colombia:** The Americas Economic Conference at Bogota recommended a broad program of land reform, low-cost housing, education and health measures for Latin America. **France:** The Government recognized Senegal as a sovereign state, independent of the Mali Federation.

12. **United Nations:** In his annual report to the General Assembly, Secretary-General Hammarskjold said that the concept of the major powers as "a kind of 'built-in' directing group" in the Security Council was outmoded. **United States:** Hurricane Donna brought winds of ninety miles an hour into the New York metropolitan area and New England. Since September 2, Donna had killed 118 persons in the Caribbean and 30 on the mainland. . . . In reply to fears expressed concerning the independence of a Roman Catholic president, Democratic Candidate Senator Kennedy said that should the time come when his duty to the nation and his conscience were in conflict, he would resign his public office.

13. **East Germany:** The Government announced that it would not honor West German passports for West Berliners. **The Republic of the Congo:** The United Nations relinquished control of the Leopoldville radio station and began to permit civil aircraft to use the airports. **United States:** Under the Civil Rights Act of 1957 the Justice Department asked for an injunction to prohibit economic pressures against Negro voters in Haywood County, Tennessee.

14. **The Republic of the Congo:** Colonel Joseph Mobutu, Army chief of staff, announced that the Army was taking over the Government until January 1, 1961.

17. **United Nations:** The Soviet Union vetoed a compromise resolution on the Congo. Since the Security Council was deadlocked, the United States called a special session of the

General Assembly. The first American resolution at the session—a proposal to admit newly independent states immediately—was overwhelmingly defeated. **The Republic of the Congo:** Soviet and Czech ambassadors and their staffs left the country under orders from President Kasavubu. **United States:** President Eisenhower ordered that the flag of Panama be flown in a public park in the Canal Zone beside the American flag.

19. **Pakistan:** India and Pakistan signed the Indus River Pact, an agreement to construct $1,070,000,000 worth of dams for irrigation and power, mainly in disputed Kashmir.

20. **United Nations:** The special session of the General Assembly passed, 70 to 0, an Afro-Asian resolution supporting Secretary-General Hammarskjold's policies in the Congo. **The Republic of the Congo:** President Kasavubu appointed a College of High Commissioners, headed by Justin Bomboko, to administer the Congo. Colonel Mobutu, who claimed control of the Government in the name of the Army, had suggested the college and supported it.

24. **Cuba:** The Government recognized Communist China and North Korea. **United States:** The Navy launched the Enterprise, world's largest ship and first nuclear-powered aircraft carrier.

26. **United States:** Presidential candidates Vice-President Nixon and Senator Kennedy were watched by an estimated 73,500,000 people during their first televised debate.

28. **France:** The Government instituted repressive measures against intellectuals who had signed a manifesto urging Frenchmen not to participate in the Algerian War.

30. **West Germany:** The Government announced that, unless travel restrictions against West Berlin were lifted, all West German trade with East Germany would halt on January 1, 1961. **Laos:** Captain Kong Le, successful leader of a neutralist coup, refused to obey the premier he had installed. Captain Kong had been ordered to cease fighting the pro-Western Rightists. **United States:** The State Department warned American travelers to avoid Cuba if possible.

• • •

OCTOBER

HISTORIC HEADLINES

Cabinet Reorganization in Canada. In an effort to halt mounting criticism of his Conservative Party's defense policy, Prime Minister John Diefenbaker on October 11 reorganized his Cabinet. Defense Minister George R. Pearkes, who had made several moves toward integrating Canadian arms with those of the United States, was replaced by Douglas Scott Harkness, who had been minister of agriculture. At the same time, George Hees moved up from his position as minister of transport to replace Gordon Churchill as minister of trade and commerce. Mr. Churchill's policies had been much criticized by the opposition Liberal Party. Former Prime Minister of New Brunswick Hugh J. Flemming, whose government was defeated at the polls in September, was appointed to head the newly created ministry of forests. Mr. Flemming was not a member of the House of Commons but was expected to run for a seat in a by-election.

Seven other ministries were affected by the reorganization. In all, four new men were brought into the Government. The new Cabinet included twenty-four ministers, the largest number in Canada's peacetime history.

CHRONOLOGY OF EVENTS

1. **Greenland:** The first United States BMEWS missile-tracking station began operations at Thule. It will provide fifteen minutes' warning in case of an attack across the North Pole by intercontinental ballistic missiles. **Nigeria:** Independence from Great Britain was proclaimed.

3. **Brazil:** Former Governor of São Paulo State Janio da Silva Quadros, a political independent, was elected president.

4. **United States:** The Army launched Courier, a

WIDE WORLD

Japanese Socialist Inejiro Asanuma (left) just before he was fatally stabbed.

Hunting for survivors after an Eastern Air Lines plane crashed in Boston, October 4.

WIDE WORLD

OCTOBER (Cont.)

communications satellite, which receives messages from the ground, stores them and replays them at command.

5. **South Africa:** In an all-white referendum, a majority of voters favored making South Africa a republic instead of a monarchy. Prime Minister Verwoerd, leading spokesman for apartheid, backed the move. The vote was widely interpreted as a victory for the Prime Minister's racial policies. **Great Britain:** The annual Labor Party conference resolved that the party should work toward neutrality and unilateral nuclear disarmament for Britain. Hugh Gaitskell, leader of the party, announced his opposition to the resolution.
6. **United Nations:** The five neutralist sponsors of the resolution calling for an early meeting between Premier Khrushchev and President Eisenhower withdrew the resolution. It had been very much weakened in parliamentary moves supported by the United States.
7. **France:** President de Gaulle said that no nuclear weapons should be used by the West, in actual warfare, without French approval. **United Nations:** The General Assembly admitted Nigeria, bringing total United Nations membership to ninety-nine.
8. **Taiwan:** Lei Chen, who organized the China Democratic Party to oppose the ruling Nationalists, was sentenced to seven years in prison for publishing "seditious" articles. Other leaders of the China Democratic Party also received prison terms. **United Nations:** For the tenth straight year the General Assembly postponed debate on the question of admitting Communist China. The percentage of the membership voting for postponement was lower than ever before.
10. **Pakistan:** A tropical storm followed by a tidal wave killed an estimated 6,000 people in East Pakistan.
11. **Great Britain:** A commission headed by Viscount Monckton called for greater African representation in the largely white Government of the Federation of Rhodesia and Nyasaland.
12. **Japan:** A Right Wing assassin killed Socialist Party Chairman Inejiro Asanuma, stabbing him twice with a ceremonial sword. **United Nations:** General Assembly President Frederick Boland broke his gavel pounding a stormy session of the assembly into abrupt recess. During the meeting, Premier Khrushchev had called a Philippine delegate a "jerk" and had removed a shoe and pounded it on the desk. A Soviet proposal to end colonialism was being discussed.
13. **United States:** The Air Force recovered three black mice after their seven-hundred-mile trip above the earth's surface in a missile nose cone. . . . The Pittsburgh Pirates took the World Series from the New York Yankees, four games to three.
14. **Argentina:** The general staff of the Army forced the resignation of the Secretary of War. **Cuba:** The Government nationalized all Cuban banks, 105 sugar mills, and other large industries on the island.
17. **United States:** The State Department announced that military aid to Laos, which had been suspended for about ten days because of the confusing political situation in that country, would be resumed.
18. **Laos:** Premier Souvanna Phouma authorized publication of a National Assembly decree of October 17 proclaiming communism incompatible with the Laotian way of life.
19. **France:** Former Gaullist Jacques Soustelle called for the formation of a new Rightist political party to oppose President de Gaulle's policies, especially those on Algeria. **United States:** The Government announced an embargo on all goods to Cuba except for medical supplies and most foods.
20. **Great Britain:** Speculation brought the London price of gold up to $40.60 an ounce. The United States rate continued at $35 an ounce, a price it has held for about twenty-six years. **United States:** The Government announced the recall of Ambassador to Cuba Philip W. Bonsal for consultation. No date was set for his return to Cuba.
21. **Puerto Rico:** A Roman Catholic pastoral letter forbade Catholics to vote for the Popular Democratic Party of Governor Luis Muñoz Marin.
22. **Austria:** The Conservative-Socialist coalition Government, headed by Chancellor Julius

Raab, resigned because of a dispute between the two parties of the coalition over 1961 budget estimates.

23. **Tunisia:** Premier Ferhat Abbas of the Algerian Provisional Government in exile said that the Communist Chinese and Soviet "friends" of Algeria had promised increased support for the Algerian nationalists.

24. **France:** A motion of no confidence in the De Gaulle–backed Government of Premier Debré was defeated. The motion gathered 207 votes, but 70 more would have been needed to turn the Debré Government out of office.

26. **El Salvador:** An Army-civilian junta, led by Colonel Cesar Yanes Urias, seized the Government in a bloodless coup. **Soviet Union:** Identical British, French and American notes were delivered in Moscow protesting a Soviet statement that air corridors to West Berlin were intended for the sole purpose of carrying supplies to Western troops in that city. The Western position was that the corridors could be used for any purpose desired by the West.

27. **France:** Riots broke out in Paris between supporters of a negotiated peace in Algeria and those who favored integrating Algeria with France. Many people were injured and 485 were arrested. **United Nations:** The General Assembly unanimously approved a plan sponsored by the United States and five other nations to supply surplus food to underdeveloped countries. . . . Austria and Italy agreed to a resolution passed by the Special Political Committee asking them to resume talks on the status of South Tyrol. Both nations claim sovereignty over the area. **Laos:** Premier Souvanna Phouma announced that his Government would be "very happy to accept Soviet aid." **United States:** The Federal Bureau of Investigation arrested a Soviet United Nations employee and a German-born artist on charges of conspiring to obtain photographs of American military installations for transmittal to the Soviet Union.

28. **United States:** The Government revealed that Cuba was receiving large, secret shipments of arms from the Soviet bloc.

30. **United States:** An agreement between the United States and Guinea for American economic and technical assistance, signed September 30, 1960, was disclosed. Previously, most of Guinea's aid had come from the communist bloc.

31. **Iran:** Queen Farah Diba gave birth to a son, heir to the throne of Shah Mohammed Reza Pahlavi. **Pakistan:** A second tropical storm and tidal wave hit East Pakistan, killing 4,000 people. Total deaths attributed to this storm and the one on October 10 had climbed to 10,000.

• • •

NOVEMBER

HISTORIC HEADLINES

United States Presidential Election: Senator John Fitzgerald Kennedy, Democrat, of Massachusetts, was elected the 35th President of the United States on November 8. Senator Kennedy and Senator Lyndon B. Johnson of Texas defeated Republican candidates Vice-President Richard M. Nixon and Henry Cabot Lodge. (For additional information on the election see pages 91, 156 and 366.)

New Orleans School Integration: A special session of the Louisiana state legislature convened November 4 to block integration of New Orleans public schools. The legislature passed an interposition act holding that the United States Constitution does not give the Federal Government control over state schools. Despite this action, desegregation went into effect November 14 when the Orleans Parish (county) school board ignored a state demand that schools remain closed. On November 18, school-board lawyers asked Federal Court action. On November 30 a three-judge Federal Court voided the state interposition act, directed that New Orleans public schools comply with the 1954 Supreme Court desegregation ruling and enjoined officials from further interference. The Louisiana attorney general said the decision would be appealed to the United States Supreme Court.

CHRONOLOGY OF EVENTS

1. **Great Britain:** Britain agreed to provide an American missile-submarine base at Holy Loch, Firth of Clyde, Scotland. **United Nations:** The General Assembly voted down a demand by Cuba and the Soviet bloc for immediate debate on Cuba's charges of a threat of aggression and invasion by the United States. **United States:** President Eisenhower stated that the United States would defend its Guantanamo Bay naval base in Cuba. **Canada:** The Conservative Party lost three out of four interim elections in Quebec and Ontario.

2. **Cuba:** President Osvaldo Dorticos Torrado said that the Cuban Government would never attack the American naval base at Guanta-

Marines arrive for shore leave at Guantanamo Bay, United States naval base in Cuba.

WIDE WORLD

WIDE WORLD

Puerto Rico's Governor Luis Muñoz Marin campaigning.

"LONDON TIMES"

Some of the hundreds of British vessels laid up because of the lowest world freight shipping rates in twenty years.

NOVEMBER (Cont.)

namo Bay, but would claim the territory it occupies "in the proper time and through the proper political procedure."

4. **France:** President de Gaulle offered self-determination to Algeria, on condition that a cease-fire precede political agreement.

7. **United States:** A strike of New York City public-school teachers, the first in history, disrupted classes. It was called by the United Federation of Teachers.

8. **Puerto Rico:** Luis Muñoz Marin was re-elected to his fourth term as governor of Puerto Rico. **United Nations:** President Joseph Kasavubu demanded that his Congolese delegation be seated in the General Assembly.

10. **France:** The French Senate voted 186–83 against President de Gaulle's plan for a French nuclear-armament program. **United States:** President-elect Kennedy announced that he would retain Allen W. Dulles as head of the Central Intelligence Agency and J. Edgar Hoover as director of the Federal Bureau of Investigation.

11. **United States:** The United States Government protested the execution of three Americans in Cuba in October for armed revolt against the Castro regime, stating that they were put to death more for their nationality than because of the nature of their crime.

15. **United States:** The $110,000,000 nuclear-powered submarine George Washington, first to be armed with thermonuclear missiles, went into service from Charleston, South Carolina.

16. **United States:** President Eisenhower ordered cuts in foreign spending by all Federal agencies, to reduce the flow of gold out of the United States by $1,000,000,000 a year.

17. **United States:** It was announced that, at the request of Guatemala and Nicaragua, President Eisenhower had ordered a patrol of Central American waters by the United States Navy to protect those countries against any attempted "landing of armed forces or supplies from abroad" by communist-led elements.

20. **Japan:** The pro-Western Liberal-Democratic Party of Premier Hayato Ikeda won a decisive victory in elections to the House of Representatives.

21. **The Republic of the Congo:** The United Nations forces and the Congolese Army met in their first armed clash in Leopoldville, when the UN forces blocked expulsion of Nathan-

iel A. Welbeck, personal representative of the President of Ghana. Several persons were killed. **United Nations:** Secretary-General Dag Hammarskjold warned that, unless $20,000,000 could be raised by January 1, United Nations forces would have to be withdrawn from the Congo.

22. **United Nations:** President Kasavubu and his Congolese delegation were seated in the General Assembly after a long debate. **United States:** The Navy launched the Ethan Allen—most powerful of its nuclear submarines—at Groton, Connecticut. The new sub is designed to fire Polaris missiles 1,500 miles.
23. **United Nations:** President Kasavubu indicated that he would permit an African-Asian conciliation committee to visit the Congo.
24. **Soviet Union:** Reports from the communist summit meeting in Moscow said that Khrushchev's "peaceful coexistence" policy was favored by a majority of the eighty-five-or-so party delegates.
25. **United States:** A son, John Fitzgerald Kennedy, Jr., was born to President-elect and Mrs. Kennedy in Washington.
26. **France:** Members of the Western parliaments and legislatures attending the NATO conference in Paris adopted a resolution approving NATO control over any decision to use nuclear weapons, with the exception of United States weapons not under NATO jurisdiction. **United States:** The drive for integration of Atlanta lunch counters resumed when negotiations during a month's truce brought no agreement.
27. **Ghana:** President Kwame Nkrumah, charging the United States, Britain and France with aiding Belgium's attempt to regain control in the Congo, said that he had asked nine African countries to organize, with Ghana, an army to operate either independently or under the United Nations.
28. **United States:** The Court of Appeals reversed the conspiracy conviction against twenty men who met at Apalachin, New York, in 1957. **Venezuela:** President Romulo Betancourt called on the Army to maintain order as rioting against the Government entered its fourth day in Caracas.
29. **United Nations:** The Soviet Union refused to pay any share of expenses for United Nations forces in the Congo and demanded withdrawal of the troops to prevent the financial collapse of the UN.
30. **Great Britain:** Sir Winston Churchill celebrated his eighty-sixth birthday.

● ● ●

DECEMBER

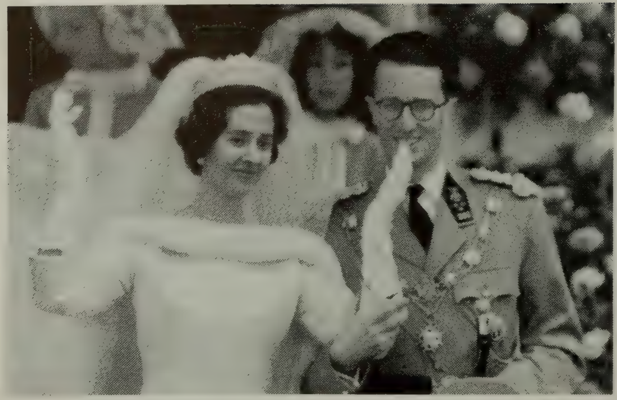
HISTORIC HEADLINES

President-Elect Kennedy Chooses His Cabinet: President-elect John F. Kennedy chose the first member of his Cabinet on December 1 when he named Governor Abraham A. Ribicoff of Connecticut to be **Secretary of Health, Education and Welfare.** Shortly after midmonth the Cabinet was completed, as follows: **Secretary of State,** Dean Rusk, President of the Rockefeller Foundation; **Secretary of the Treasury,** C. Douglas Dillon, Under Secretary of State in the second Eisenhower term; **Secretary of Defense,** Robert S. McNamara, President of Ford Motor Company; **Attorney General,** Robert F. Kennedy, lawyer, who served as counsel for the Senate labor-rackets committee and as campaign manager for his brother, the President-elect; **Postmaster General,** J. Edward Day, Vice-President of the Prudential Insurance Company; **Secretary of the Interior,** Stewart L. Udall, Arizona, member of the House of Representatives; **Secretary of Agriculture,** Orville L. Freeman, Governor of Minnesota; **Secretary of Commerce,** Luther H. Hodges, Governor of North Carolina; **Secretary of Labor,** Arthur J. Goldberg, of Chicago and Washington, General Counsel for the United Steelworkers.

Adlai E. Stevenson was named **United States Representative to the United Nations,** with Cabinet rank.

Other important appointments announced by President-elect Kennedy included:

Vice-President-elect Lyndon B. Johnson as **Chairman of the Committee on Government Contract Compliance** and of the **National Aeronautics and Space Council;** Chester Bowles, member of the House of Representatives from Connecticut, as **Under Secretary of State;** G. Mennen Williams, Governor of Michigan, as **Assistant Secretary of State for African Affairs;** David E. Bell of Harvard as **Director of the Budget;** Roswell L. Gilpatric, a New York lawyer, as **Deputy Secretary of Defense;** Paul H. Nitze, former New York investment banker who has been with the Defense and State Departments, as **Assistant Secretary of Defense for International Affairs;** John B. Connally, Jr., Fort Worth, Texas, lawyer and Navy veteran, as



Smiling broadly, King Baudouin of Belgium stands beside his bride, Doña Fabiola, as she waves to spectators outside the church. The royal couple were married on December 15.

PHOTOS, WIDE WORLD

Secretary of the Navy; Eugene M. Zuckert, Washington lawyer and former member of the Atomic Energy Commission, as **Secretary of the Air Force;** Mrs. Elizabeth R. Smith, California Democratic National Committeewoman, as **Treasurer of the United States;** Professor Archibald Cox, of Harvard Law School, as **Solicitor General;** and Rex M. Whitton of Jefferson City, Missouri, as **Federal Highway Administrator.**

CHRONOLOGY OF EVENTS

1. **The Republic of the Congo:** The Government of President Kasavubu broke off diplomatic relations with the United Arab Republic, accusing Egyptian diplomats of plotting with deposed Premier Lumumba.
2. **Vatican City:** For the first time in history, a head of the Anglican Church visited a Roman Catholic pope. The Most Reverend Geoffrey Francis Fisher, 99th archbishop of Canterbury, called at the Vatican for a courtesy visit with Pope John XXIII. **The Republic of the Congo:** Deposed Premier Lumumba, reportedly arrested in Kasai on December 1, was brought back to Leopoldville as a prisoner of Colonel Mobutu, head of the Army regime.
4. **United States:** President-elect Kennedy set up a committee, headed by Senator Paul H. Douglas of Illinois, to work out a Federal program for aid to economically depressed areas and solution of their problems.
8. **Cuba:** The Castro Government nationalized the Royal Bank of Canada, with estimated assets of $125,000,000 and twenty-three branches in Cuba. **United States:** Leading electrical manufacturers pleaded guilty to criminal antitrust charges of price fixing and rigging of bids on heavy electrical apparatus between 1956 and 1959. General Electric Company and Westinghouse Electric Corporation were among twenty-nine manufacturers and forty-six individuals named as defendants.
9. **United Nations:** Chile and the United Arab Republic were elected as nonpermanent members of the Security Council.
12. **United States:** The Supreme Court denied the State of Louisiana's appeal for stay of a Federal-court injunction which nullified a series of state enactments in connection with desegregation of New Orleans public schools. **United Nations:** Morocco, with the largest force under UN command, and Guinea announced that they would withdraw their troops from the UN forces in the Congo.
14. **United Nations:** The General Assembly voted in favor of an Asian-African demand for "speedy and unconditional end to colonialism." **United States:** The State Department confirmed reports that Emperor Haile Selassie I of Ethiopia had been overthrown in a *coup d'état* headed by his son, Crown Prince Asfa-Wossen, while the Emperor was on a state visit to Brazil.
15. **Belgium:** King Baudouin of the Belgians was married to Doña Fabiola de Mora y Aragon of Spain in Brussels. **United States:** Final official tabulations of the presidential vote showed a total of 68,832,670 votes cast and a plurality of 112,801 for John F. Kennedy over Richard M. Nixon.
16. **United States:** The worst crash in American air-travel history occurred when a United Airlines DC-8 jet and a Trans World Airline Lockheed Super-Constellation collided in fog and sleet over New York Harbor. The death toll reached 134.
17. **West Germany:** A United States Air Force

The Archbishop of Canterbury, Dr. Geoffrey Francis Fisher, in Rome to visit Pope John XXIII. Right, Ethiopian Emperor Haile Selassie after he successfully quelled an abortive revolt against his regime.

transport plane crashed in downtown Munich. The plane, carrying American students—members of service families—to England for the holidays, fell on a crowded streetcar. At least fifty persons were reported killed. **England:** The Ethiopian Embassy announced that Emperor Haile Selassie had returned to Addis Ababa and resumed control of the Government.

18. **France:** The NATO Council of Ministers reaffirmed the solidarity of the alliance as a three-day meeting ended in Paris.

19. **United States:** The nation's largest aircraft carrier, the Constellation, still under construction, was seriously damaged at the Brooklyn Navy Yard by a fire which claimed nearly fifty lives. . . . Members of the Electoral College cast their votes, electing John F. Kennedy the thirty-fifth president of the United States. **United Nations:** The General Assembly adopted a resolution recognizing UN responsibility in helping Algeria toward independence.

20. **United Nations:** The General Assembly elected Liberia to serve on the Security Council, splitting a two-year term with Ireland.

21. **United Nations:** The General Assembly adjourned until March 7, 1961, without resolving the situation in the Congo. **Saudi Arabia:** King Saud took over control of Saudi Arabia from his brother Crown Prince Faisal, who resigned.

22. **United States:** The State Department expressed "serious concern" over airlifting of military equipment by Soviet planes to pro-communist rebels in Laos.

24. **Guinea:** The presidents of Guinea, Ghana and Mali announced that their three countries had formed a union for common diplomatic representation and to promote a common economic and monetary policy. **Belgium:** Premier Gaston Eyskens made a nationwide radio appeal for restoration of order as Leftist-led strikes entered their fifth day. The strikes, protesting the Government's proposed austerity program designed to offset economic difficulties resulting from loss of the Congo as a colony, paralyzed railroads, factories, bus lines and gas and electric services.

25. **Belgium:** As Belgians celebrated Christmas with no gas and little electricity, the Socialist General Federation of Labor called for a general strike against the Government's proposed austerity program.

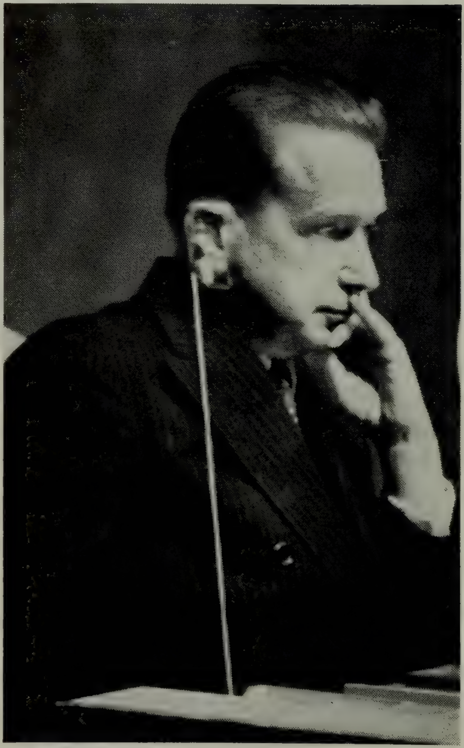
27. **United States:** It was learned that the United States, Belgium, the Netherlands, Italy and West Germany had signed an agreement for the production of F-104G Starfighter jets to serve under NATO command. Total cost of the aircraft, to be produced in Europe, will come to $1,500,000,000, of which the United States will pay $140,000,000. **France:** The French Armed Forces Ministry announced that France had exploded her third atomic bomb in the Sahara.

31. **United States:** The State Department warned that the United States would take "the most serious view" of Chinese, North Vietnamese or other intervention in support of communist rebels in Laos. . . . President-elect Kennedy appointed Dr. Robert C. Weaver to the highest Federal administrative post ever given a Negro—Housing and Home Finance Agency administrator. Dr. Weaver was vice-chairman of New York City's Housing and Redevelopment Board. **Belgium:** King Baudouin's appeal for cessation of strikes against the Government's proposed austerity measures was rejected by Socialist leaders.

A SUMMING UP

WORLD LEADERS meet at the UNITED NATIONS

THE meeting of the General Assembly in the autumn of 1960 was a historic occasion. Never before had so many of the world's top leaders, from old nations and new, gathered in the same place at the same time. The dramatic confrontation produced some spectacular clashes. Of more importance, the forum demonstrated the growing numbers and influence of the new states in Africa and Asia.



↑Secretary-General Dag Hammarskjold, face impassive, listens to criticism from Premier Khrushchev.

UPI

↑Prime Minister John Diefenbaker keeps an attentive eye on proceedings from his desk.

←
The hug of the year—Khrushchev makes a public display of embracing Cuban Premier Fidel Castro.

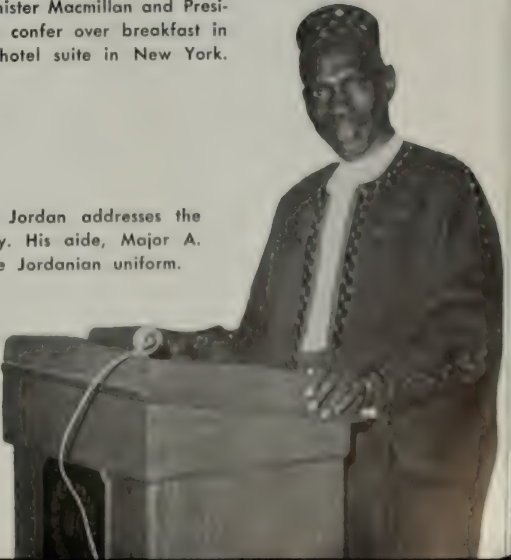
↓New UN sound: table thumping to express disapproval. The fists are Khrushchev's.

↑A side five-nation conference is attended by, left to right: India's Prime Minister Nehru; Ghana's President Nkrumah; United Arab Republic's President Nasser; Indonesia's President Sukarno; and Yugoslavia's President Tito, the host of the conference.

↑British Prime Minister Macmillan and President Eisenhower confer over breakfast in the President's hotel suite in New York.

ALL PHOTOS, UNLESS OTHERWISE SPECIFIED, WIDE WORLD

←
King Hussein of Jordan addresses the General Assembly. His aide, Major A. Mufleh, wears the Jordanian uniform.



→
Prime Minister Sir Abubakar Tafawa Balewa of Nigeria holds a press conference.

Danish King Frederik and Queen Ingrid ride with their host, President Eisenhower, beginning a state visit to Washington.

A SUMMING UP

HEADLINERS OF OUR TIME

After considerable political turmoil in Japan, pro-Western Hayato Ikeda took the reins of the Government as premier.

Cause for rejoicing in Iran: an heir to the Peacock Throne of the Shahinshah. The baby was named for his father, Reza.

Rivals for political control of the infant Republic of the Congo (the former Belgian area): Patrice Lumumba (upper left), initially the premier; and Joseph Kasavubu (above), who became the president.

SOVFOTO

On trial in Moscow: Francis Powers, pilot of the United States U–2 plane brought down over Soviet Union territory.

A great statesman under test: Can President Charles de Gaulle solve the terrible problem of French relations with Algeria?

ALL PHOTOS, UNLESS OTHERWISE INDICATED, WIDE WORLD

Among Those Who Died

FRANKLIN PIERCE ADAMS (F.P.A.), 78, former newspaper columnist; New York City, March 23.

PRINCE ALY KHAN, 48, Pakistan ambassador to the UN; near Paris, May 11.

ROY CHAPMAN ANDREWS, 76, naturalist and explorer; Carmel, California, March 11.

JUSSI BJOERLING, 49, Swedish operatic tenor; Siar Oe, Sweden, September 9.

LUCREZIA BORI, 72, operatic soprano; New York City, May 14.

BOBBY (ROBERT EDWIN) CLARK, 71, comedian; New York City, February 12.

ERNST VON DOHNANYI, 82, Hungarian composer and pianist; New York City, February 9.

JAMES A. ECCLES, 72, Canadian financier and philanthropist and governor, McGill University; Montreal, Quebec, March 3.

JAMES MONTGOMERY FLAGG, 83, magazine illustrator; New York City, May 27.

OSCAR HAMMERSTEIN 2d, 65, librettist and lyricist; Doylestown, Pennsylvania, August 23.

THOMAS CAREY HENNINGS Jr., 57, United States Senator; Washington, D. C., September 13.

SIR HAROLD SPENCER JONES, 70, former British Astronomer Royal; London, November 4.

JOHN ABBOTT LARDNER, 47, sports writer; New York City, March 24.

EARL KEMP LONG, 65, former governor of Louisiana; Alexandria, Louisiana, September 5.

BELL SYNDICATE

EMILY POST, 86, authority on etiquette; New York City, September 25.

ALFRED A. KNOPF, INC.

ALBERT CAMUS, 46, French novelist, Algerian-born, and Nobel Prize winner; Villeneuve-la-Guyard, France, January 4.

WIDE WORLD

JOHN D. ROCKEFELLER, JR., 86, philanthropist; Tucson, Arizona, May 11.

MGM

CLARK GABLE, 59, motion-picture star; Hollywood, California, November 16.

CHARLES E. K. MEES, 78, pioneer in photographic research; Honolulu, August 15.

DIMITRI MITROPOULOS, 64, Greek-born conductor; Milan, Italy, November 2.

RICHARD LEWIS NEUBERGER, 47, United States Senator; Portland, Oregon, March 9.

JOHN CARDINAL O'HARA, 72, Archbishop of Philadelphia; Philadelphia, August 28.

ADRIANO OLIVETTI, 58, Italian industrialist; Italy, February 28.

PAUL SAUVÉ, 52, Premier of Quebec; Saint Eustache, Quebec, January 2.

ELLERY SEDGWICK, 88, editor and publisher; Washington, D. C., April 21.

MACK SENNETT, estimated age 76–80, producer-director of slapstick comedies; Woodland Hills, California, November 5.

NEVIL SHUTE (NORWAY), 60, English novelist; Melbourne, Australia, January 12.

MARGARET SULLAVAN, 48, actress; New Haven, Connecticut, January 1.

WALTER DORWIN TEAGUE, 76, industrial designer; Flemington, New Jersey, December 5.

JOHN CHARLES THOMAS, 69, baritone, star of opera, concert and radio; Apple Valley, California, December 13.

LAWRENCE TIBBETT, 63, operatic baritone; New York City, July 15.

LEONARD WARREN(OFF), 49, Metropolitan Opera baritone; New York City, March 4.

JOSEPH NYE WELCH, 69, lawyer, Army counsel in the McCarthy hearings; Cape Cod, Massachusetts, October 6.

RICHARD B. WIGGLESWORTH, 69, United States ambassador to Canada; Boston, October 22.

RICHARD WRIGHT, 52, American Negro author; Paris, November 28.

WIDE WORLD

ALOJZIJE CARDINAL STEPINAC, 61, Roman Catholic primate of Yugoslavia; Krasic, Yugoslavia, February 10.

JOHN P. MARQUAND, 66, novelist and Pulitzer Prize winner; Kent's Island, Massachusetts, July 16.

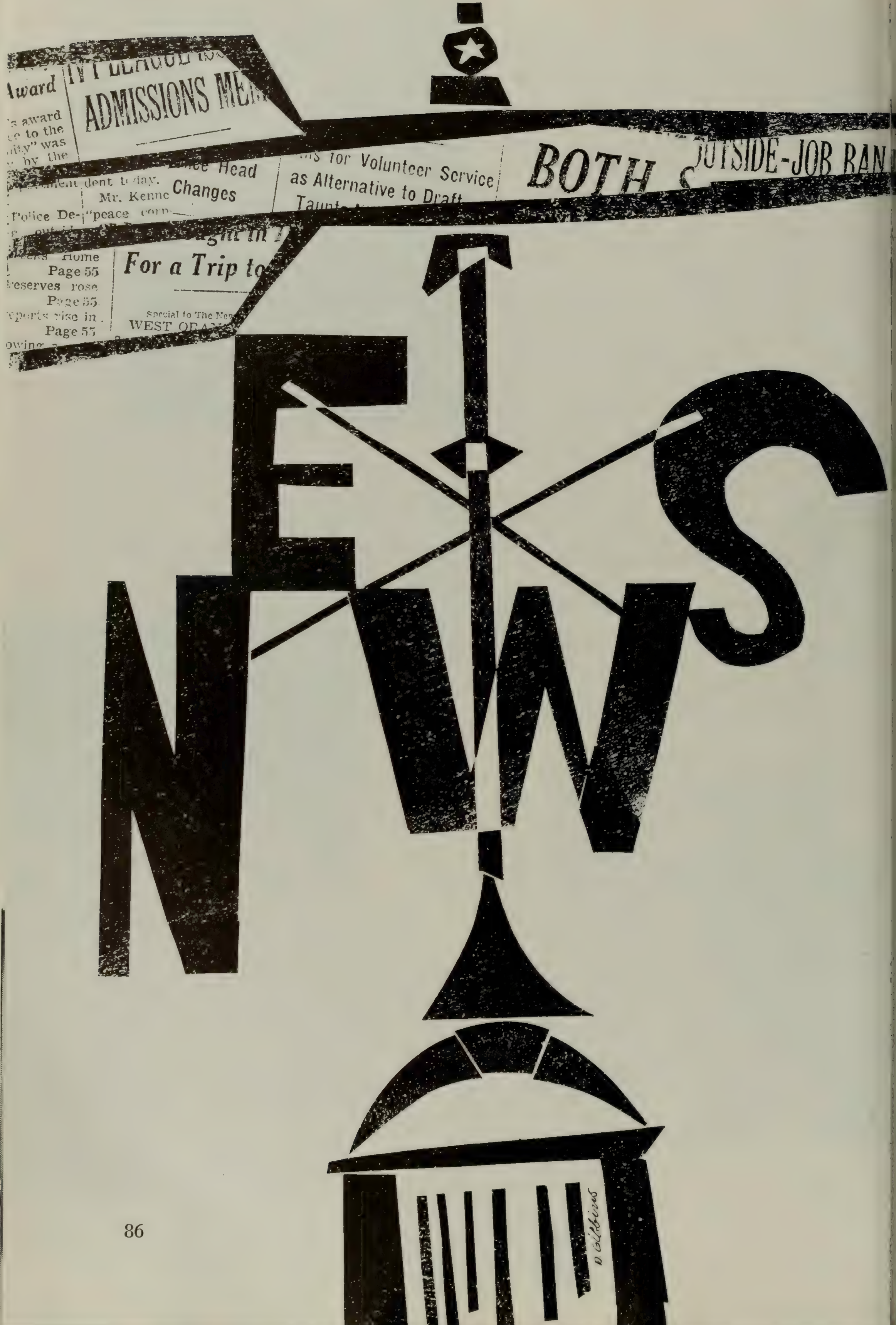
LITTLE, BROWN & CO.; PHOTO, NEWBERRY

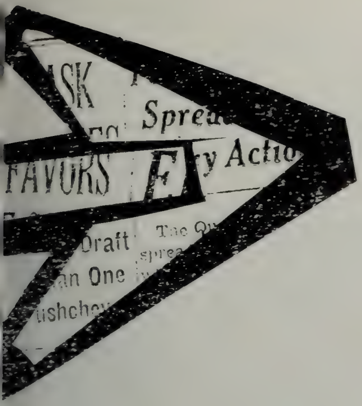
WIDE WORLD

BORIS L. PASTERNAK, 70, Russian poet and novelist, Nobel Prize winner; Moscow, May 30.

ANEURIN BEVAN, 62, British labor leader; Buckinghamshire, England, July 6.

BRITISH INFORMATION SERVICES


Award
ADMISSIONS ME
Changes
for Volunteer Service
as Alternative to Draft
BOTH
OUTSIDE-JOB BAN
For a Trip to
Page 55
Page 55
Page 55
WEST ORA
N
E
W
S
D. Gibbins



NEWS AROUND the WORLD

UNITED STATES AND CANADA

The Road to Civil Rights
William H. Stringer 88
The United States Elections—1960
Nunzia A. Bongiorno 91
Farm Subsidies
Bernard Brenner 94
The Beats
Wayne Lawson 97
The Electoral College
Robert Vermillion 100
The United States: The Prospect Ahead
Frances Stone 102
The Three-Mile Limit
A. M. Fraser 106

NEWS FROM ABROAD

Australia—Business Frontier
R. M. Younger 108
Desert Oil for France
Edward R. Sammis 111
Latin America in 1960
Concha Romero James 115
Apartheid
Andrew Martin Kamarck 120
How Good Is Soviet Education?
Ellsworth Raymond 123

INTERNATIONAL AFFAIRS

Variations on the Communist Theme
Helen Hynson Merrick 127
The New Diplomacy
Stephen Ruddy 131
The Third Force in the United Nations
Maurice Ghnassia 134
New Communist Tactics in Southeast Asia
Douglas Hyde 137
Mr. Khrushchev's Economic War
Garrett Underhill 141

FACTS AND FIGURES

Swift March toward Freedom 146
United States: Budget and Taxes .. 148
First Report on the United States Census 150
The 1959 Soviet Census 153
The Population of Canada 154
The 1960 United States Elections . 156

THE ROAD TO CIVIL RIGHTS

By WILLIAM H. STRINGER

Chief, Washington News Bureau
THE CHRISTIAN SCIENCE MONITOR

IN 1960 a potent new do-it-yourself technique enlivened the Negro's lengthy struggle to obtain social, political and economic equality in the United States. With the development of the sit-in techniques for securing equal service with white people at chain-store lunch counters, public libraries, beaches and other points of contact, the Negroes have themselves expressed a growing dissatisfaction at the slow pace of desegregation since the Supreme Court's historic school decision of 1954.

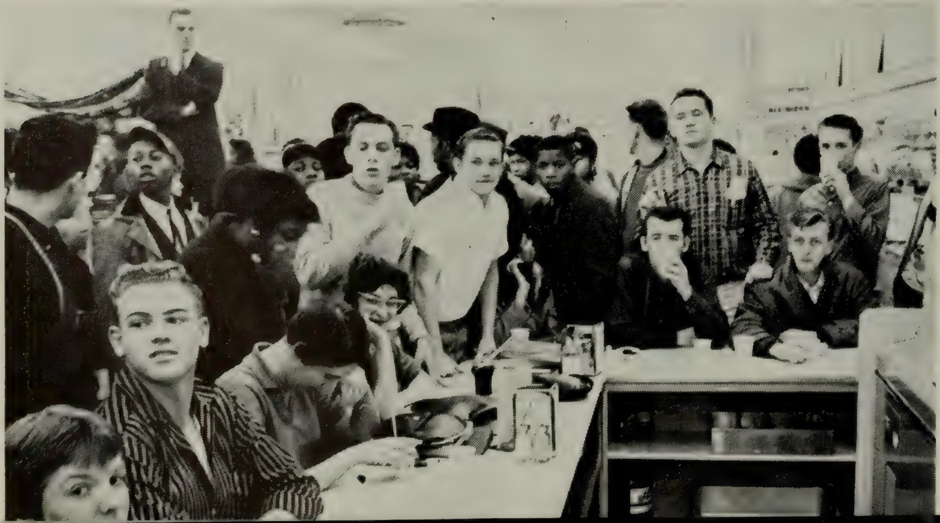
To be sure, in the autumn of 1960 public-school integration made its first penetration of the deep South. This resulted from the Supreme Court's refusal to review lower-court orders requiring modest desegregation in New Orleans and Houston. And in Richmond, Virginia, former capital of the Confederacy, integration finally began with the attendance of two teen-age Negro girls at a formerly all-white public school. In Little Rock, Arkansas, a dozen Negro students reported, unmolested and almost unnoted, for classes in traditionally all-white high schools. Among these schools was Central High, where paratroopers had been ordered on guard, three years ago, by President Eisenhower to disperse mobs of angry segregationists.

Still, in the opinion of many Negroes, the granting of equal rights had proceeded at too slow a pace. Simultaneously the hopes raised on the school front have spread over into other areas including restaurants, municipal parks and beaches —where Negroes have been denied desegregated facilities in most southern and border states.

A new generation of Negroes is impatient with their "Uncle Toms" who tolerate the old order. It is significant that the recent efforts to obtain sit-down service at variety-store lunch counters in the South have been largely the work of Negro college students. The focal point of the Negro's battle has thus shifted from the courts to the market place and has at times exploded into a larger challenge to law and order. However, the Attorney General of the United States, applying friendly persuasion in conferences with a number of chain-store executives, has obtained their quiet agreement to desegregate lunch-counter facilities. A Justice Department announcement in August 1960 said that lunch counters in 69

White students and Negroes at a Virginia lunch counter just before a fight began.

PHOTOS, WIDE WORLD



Indiana University students parade with posters in protest against the arrest of Negro students at segregated lunch counters in the South.

southern communities had been opened to Negroes.

In the past six years racial discrimination has indeed diminished in the United States. In a number of border states, such as Tennessee and Kentucky, school desegregation is moving ahead. Frequently the pattern is to start mixed classes in the youngest primary grades; then, eventually, no segregated classes will remain.

Virginia, long the intellectual leader of the South, has abandoned its own "massive resistance" campaign in favor of a pupil-placement plan that admits qualified Negroes to its formerly all-white schools. The pace remains slow, for the Supreme Court has steadfastly refused to interfere with the pupil-placement formula admittedly devised by the southern states to hold integration to a trickle.

No classes have been integrated in such deep-South states as Mississippi, Alabama and South Carolina, where two entirely separate school systems continue. Under the pupil-placement plan adopted in other southern states, the Negro child whose parents wish to send him to an integrated classroom must apply for a transfer. He must also have geographical reasons for attending the new school and then must meet standards of scholastic ability not applied to all white pupils.

The Supreme Court has, however, been vigorously active in other arenas. In quick order it has held segregation unconstitutional at public beaches and golf courses; it has struck down local laws requiring separate seating in interstate buses; it has held invalid a Louisiana statute prohibiting sports contests involving white people and Negroes.

Of course, in some instances local custom and tradition—a determination not to budge on the part of some white people—plus a reluctance to press the issue on the part of the Negroes has permitted the traditional second-class citizenship to persist. Riots and bloodshed have resulted where the Negro has suddenly demanded his rights in the deeper South.

Meanwhile, Congress has been unusually active concerning civil rights, at least when judged by the pace of history. In 1957 it enacted the first racial-rights legislation since the years immediately following the Civil War; in the election year of 1960 it passed a reinforcement of that law, which experience had shown to be necessary. The key provision of the 1957 law permitted the United States attorney general to bring suit on behalf of Negro-voting rights—to move against county or state registrars who refused to allow Negroes to register for voting. The 1960 law empowers Federal judges to appoint referees who shall, on application, register Negro voters in areas where the Federal court finds a "pattern or practice" of discrimination against Negro voting.

It has frequently been argued that if the Negro is guaranteed his voting rights, all other rights will flow unto him. The vote is a tool which all politicians respect. The possession of voting power in southern cities here and there has brought Negroes fairer treatment by the police, better municipal facilities and sometimes better jobs in Government.

Federal legislation will not, however, have much impact on the black belts of the deep South, those rural counties where Negroes sometimes outnumber the whites. In these areas local intimidation, the determination to keep the Negroes "in their place" and the readiness to use economic or even physical coercion establishes barriers to Negro voting that are strikingly effective. It is seldom necessary to resort to physical beatings, though these still do happen. The mere threat of loss of job to a Negro laborer or even a school teacher, or the threat of withdrawal of credit to a Negro farmer whose farm is mortgaged is sufficient inducement to "behave." Hence, for some time there will probably continue to be counties in Alabama and Mississippi where not more than a few dozen Negro voters—and sometimes not even one—are cast.

In this atmosphere of minimum progress, undoubtedly the real significance of the chain-store lunch-counter demonstrations is that a new spirit of militancy has been revealed among the young, better educated Negroes, a readiness to stand up for their Constitutional rights rather than to leave matters solely to the courts and to slow legal processes. This new spirit has come as a surprise to many white Southerners, who have maintained that they understood their black brethren and that a benevolent despotism was acceptable to them.

The Southern Regional Council, composed of white and colored Southerners whose objective is the improvement of race relations, reports a partial shift in leadership and technique to the younger, more determined Negro groups and to "new and flexible uses of the nonviolent protest."

Actually, the southern Negro has discovered Gandhi's principles of passive resistance and nonviolent protest and he has begun to apply them in his battle for equality. The nonviolent tactics serve to discourage harsh repressive countermeasures. Though local police captains have sometimes hauled the sit-in demonstrators off to jail or broken up Negro marches on state capitals, the technique of "no fight back" is a baffling one to counteract.

It is obvious that the United States is traveling down a long and complex avenue in its drive toward racial equality. The national conscience has been aroused and more progress is being made than in some of the Asian countries where racial and religious discrimination exists.

In 1960, presidential election year, both the Republican and the Democratic parties wrote strong civil-rights planks into their platforms, approving peaceful sit-in demonstrations and promising new efforts to obtain job equality for Negroes.

Through the potential power of his vote, through court action, through church preaching and occasionally through the work of the labor unions, the Negro is beginning to emerge from his second-class citizenship. But the leaven that is producing the greatest change today is undoubtedly the awakened consciousness of the Negro himself—the realization that he is a free agent and that he can, by various effective techniques, help to raise his own status in his community.

The United States Elections—1960

By NUNZIA A. BONGIORNO

IN November 1960 John Fitzgerald Kennedy, Democratic senator from Massachusetts, was elected the 35th President of the United States. He was the first Roman Catholic and, at 43, the youngest man ever elected to the presidency. Lyndon Baines Johnson of Texas, elected to the vice-presidency, had the distinction of winning two offices simultaneously. A special Texas state law had made it possible for him to run for re-election to the United States Senate. For the first time since 1954 the president and the majority in Congress were of the same party.

The election itself, in which a record-breaking 68,832,670 voters (about 80 per cent of those registered) cast their ballots, may well be a subject for discussion for years to come. Most public-opinion polls had forecast a close election. Few voters, however, could have foreseen the long period of suspense—following what looked like an early Kennedy sweep—before Vice-President Nixon conceded the election to his opponent. So close was the contest in many states that even after Nixon's concession there was doubt as to whether Kennedy would retain his slim margin of the popular vote. His plurality in the Electoral College was not seriously threatened.

Kennedy's victory was made possible by his strength in a combination of northern industrial states, with their large electoral votes, and a majority of the states of the traditionally Democratic South. New York went to the Democrats with a plurality of more than 383,000 votes; Connecticut, 91,242; and Pennsylvania, 116,326 Kennedy's home state of Massachusetts gave him a plurality of over 510,424 votes. The traditionally Republican states of northern New England—Vermont, New Hampshire and Maine—went to Nixon. In most other states the contest was very close, but the large Democratic vote in the big cities such as Detroit and Chicago enabled the Democrats to override the Republican vote in the rural areas. In the South, Nixon carried Virginia, Kentucky, Tennessee, Florida and Oklahoma, but he lost Texas, which had voted twice for President Dwight D. Eisenhower. In the

WIDE WORLD

The winners of the election a few days after their hairbreadth victory. Senator Lyndon B. Johnson (Vice-President-elect) welcomes Senator John F. Kennedy (President-elect) to the LBJ ranch in Texas. Although earlier the two men had been rivals for the Democratic nomination for president, as running mates they formed a harmonious team during the campaign.

Middle West, Kennedy carried Illinois and Michigan, but he lost Indiana and Ohio. Nixon won in Ohio by more than 270,000 votes. Of the west-central farm states, Nixon carried all except Minnesota and Missouri. In the West, Kennedy won Nevada and New Mexico. The final vote in California, which eventually went to Nixon, was in doubt for several weeks. This was the first presidential election for the new states of Alaska and Hawaii. The three electoral votes of Alaska went to Nixon and Hawaii's to Kennedy.

The Democrats retained control of Congress but with slightly reduced strength. In the House of Representatives the Republicans gained 21 seats, making the line-up 262 Democrats and 174 Republicans in the Eighty-seventh Congress. The disputed Indiana Fifth District seat was still to be decided. A number of freshman Democratic representatives, who had been returned from normally Republican districts during the big Democratic victory of 1958, lost their House seats. At the same time, such stalwarts as Speaker Sam Rayburn of Texas and Majority Leader John W. McCormack of Massachusetts ran unopposed. In the Senate the Republicans made a gain of one seat.

Of the 27 gubernatorial contests, 15 were won by Democrats, a gain of 1, which brought their total of governorships to 34. The Republicans won 12.

What were the chief factors in the Kennedy victory? Opinions differ, but those factors most widely mentioned include religion, the presence of Johnson on the ticket, the Negro and other minority votes and the radio-television "debates." Some believe that Kennedy's Roman Catholic religion may have been an actual advantage to him in some of the northern industrial states. At the same time it probably lost him normally Democratic votes in rural Protestant areas in such states as Oklahoma, Kentucky and Tennessee. The nomination of Johnson for the vice-presidency received considerable criticism at the time when it was made, but in retrospect it was clearly evident that Johnson was able to deliver Texas and most of the southern states. It was generally felt that Nixon had not succeeded in retaining the Negro vote that had previously gone to President Eisenhower. Others felt that the Negroes had voted according to their economic interests. Kennedy also received much support from labor, which actively campaigned in his behalf. The radio-television debates served to dispel the image of Kennedy as immature.

It has been said many times that John F. Kennedy began to run for the presidency the day after he was defeated by Senator Estes Kefauver for the Democratic vice-presidential nomination in 1956. At the beginning of 1960 Governor Ribicoff of Connecticut and John Bailey, that state's Democratic chairman, announced that Kennedy would be a candidate for the presidency. He then entered nine well-chosen primaries in which he successfully demonstrated to party leaders that he had the qualities of a political win-

The republican candidates before the election: Richard M. Nixon and Henry Cabot Lodge.

WIDE WORLD

ner. His victory in Protestant West Virginia was particularly important for this purpose.

By the time of the Democratic Convention in Los Angeles in July, the skillful work of Kennedy's organization practically assured his nomination on the first ballot over such formidable rivals as Adlai Stevenson, Senator Lyndon Johnson and Senator Stuart Symington. In a surprise move, Kennedy offered his chief rival, Johnson, the vice-presidential nomination. Johnson accepted. The convention had already adopted what was referred to as a "militant" platform. Drafted under the chairmanship of Representative Chester Bowles of Connecticut, it contained an unusually strong civil-rights plank which antagonized most of the southern delegates. Johnson's nomination was considered a move to "placate the South." In his acceptance speech, Kennedy spoke of the challenge of a "new frontier—the frontier of the 1960's."

Later in July, in Chicago, the Republicans nominated Richard M. Nixon for the presidency. His candidacy had been pressed since the Eisenhower-Nixon victory of 1956. His only serious competition came from Governor Nelson A. Rockefeller of New York, who had earlier withdrawn as a candidate after it became evident that the party leaders preferred Nixon. Nevertheless, Rockefeller was still clearly "available" at Chicago. His earlier criticisms of the proposed party platform impelled Nixon to seek out Rockefeller in New York where, in an eight-hour meeting, agreement was reached on a stronger and more liberal platform, which was eventually adopted by the convention. Rockefeller then withdrew his name from consideration. After the withdrawal of Senator Barry Goldwater of Arizona, Nixon was nominated by acclamation. Henry Cabot Lodge, United States representative to the United Nations, received the vice-presidential nomination.

In a concluding twenty-three-day session of Congress, following the conventions, Senator Kennedy and his Democratic supporters were unable to get their three main legislative programs through Congress. These were concerned with an increase in the $1.00-an-hour minimum wage, medical care of the aged via Social Security, and aid to school construction.

Beginning in August the rival candidates undertook one of the longest and most arduous campaigns in United States election history. Nixon traveled more than 60,000 miles and campaigned in every state in the Union; Kennedy traveled about 75,000 miles and campaigned in 44 states. Both visited the new states of Alaska and Hawaii. Throughout, Nixon stressed his experience in Washington and his trips abroad, on which he had talked with world leaders. Kennedy insisted that United States prestige abroad had declined, due to Russian achievements and the lack of a dynamic United States policy. Nixon asserted that United States prestige had never been higher.

Kennedy proposed to stimulate the domestic economy by increased Federal activity, while Nixon favored reliance upon the states and private industry.

On the religious issue, Kennedy spoke out forcefully in Houston, Texas, concerning his belief in the separation of church and state when he addressed a meeting of Baptist ministers and answered questions from the floor. Lyndon Johnson made a highly successful whistle-stop tour through the South and brought most of the southern politicians in line. Toward the close of the campaign, when the tide seemed to be running in Kennedy's favor, President Eisenhower took an active part and campaigned vigorously in New York, Cleveland and Pittsburgh for the Republican ticket. On the last day of the campaign, Nixon appeared on a four-hour television question-and-answer session.

After it was all over, John F. Kennedy, at the armory in Hyannis, Massachusetts, promised that "every degree of mind and spirit that I possess will be devoted to the long-range interests of the United States and to the cause of freedom around the world."

Editor's note: *More detailed information on election results appears on pages 156-157. Also see "Review of TV and Radio" on page 362.*

FARM SUBSIDIES

By BERNARD BRENNER

Farm Editor

United Press International

GOVERNMENT subsidies for agriculture have become one of the most controversial of all United States Federal programs. The Agriculture Department's total budget has averaged close to $6,000,000,000 annually during the last five or six years. Half, or even more than half, of this amount has gone in recent years to support farm income directly or indirectly. Much has been written about the high costs and the huge stocks of surplus crops built up in the effort to support prices. But these stockpiles are only one side of a program aimed at giving the farmer a chance to compete on even terms in the national economy.

Why does the Government help the farmers?

Supporters of Federal farm aid argue that farmers must have protection because they operate in a protected economy. Business and industry are protected by such Federal aids as tariffs and direct subsidies. Labor has laws protecting union organization and minimum wages. Without some organized protection then, according to the advocates of Government help for agriculture, individual farmers would be at the mercy of an "administered" economy.

Most of the controversy over farm programs in recent years has occurred over the question as to how far the Government should go in supporting farm prices and attempting to control production. But let's look first at just what the Government has been doing and what the results have been.

Government aid to farmers in one sense goes back to the founding of the nation. Farmers, along with other groups in the infant country, were helped by early subsidies for canals and railroads. But it was not until the farm depression of the 1920's that there was a serious effort to get the Government directly into the business of supporting farm prices and income. In 1929, a new Federal Farm Board was given $500,000,000 for use in making loans on stored surplus crops or in purchasing the crops to stabilize prices. But there was no brake on production and by 1932 the board had to admit failure.

The present era of farm-price supports began in 1933. The new programs were based, in general, on the idea that if farmers wanted Government help in keeping prices up, they would have to co-operate by keeping production in line with needs. The new plans assumed that any surpluses would go into a sort of ever normal granary for use in seasons of short crops. From these beginnings have come the widely varied price-support programs in operation today.

For five major crops—wheat, cotton, peanuts, tobacco and rice—the Government supports market prices in return for farmer acceptance of Federal control of production and marketing. For other crops, including corn and all the animal feed grains, the Government supports prices without requiring farmers to limit the amount they grow. For many products, including perishable foods such as meat and vegetables, there is no direct price-support system. But the Agriculture Department has a special continuing fund of about $300,000,000 a year taken from tariff receipts; this fund is often used to buy up surplus perishable foods for donation at home or abroad.

For most crops that get direct supports the Government relies mainly on a loan system. It works this way. A support price is announced for wheat, for instance. Then, if a farmer can't get that much by selling in the open market, he can pledge his crop as security for a price-support loan. When the loan matures at the end of the marketing season, the farmer can choose one of two options. He can redeem his wheat and sell it. Or, if market prices are still below the support level, he can keep the loan money and the Government becomes the owner of the wheat.

One of the faults of this system, admitted by all farm factions, is that loopholes in control laws have allowed production to expand in spite of controls. Wheat growers, for instance, can qualify for supports by keeping their planting within acreage allotments. But, because of technological advances in agriculture in recent years, the yield from each acre has been going steadily upward. It is through this inadequate mechanism of supports based on acreage control that the Government has built up a surplus wheat supply equal to more than one full year's domestic and export needs. But this is not the only way in which the Agriculture Department supports farm prices.

For wool, the Department fixes a support price and then pays directly to farmers an amount equal to the cash difference between market prices and support prices. To support sugar prices, the Government controls marketing through a tonnage-quota system and also gives payments to growers who obey planting restrictions and other rules. To support dairy farmers, the Government sets floor prices for butter, cheese and nonfat milk solids. Then it buys all of these products which the open market will not absorb.

There are other important programs, sometimes considered subsidy programs, that indirectly bolster farm income or the long-range value of farm property. Some are designed primarily to protect the soil, such as the Agricultural Conservation Program (ACP). Under this program the Government pays part of the cost when farmers carry out any one of a large number of approved soil-conserving practices. Other programs operate on the fringes of the price-support system to reduce over-all farm production or to help move surpluses into foreign markets when they pile up to depress market prices at home.

The most important of the recent Government efforts to curb over-all production is the soil bank. From 1956 through 1960, farmers were offered contracts under which they could retire land—sometimes entire farms—from production for between three and ten years, in the conservation-reserve section of the soil bank. In return for idling the land and covering it with grass or trees, farmers received Government rental payments averaging in most cases about $13.50 per acre annually. From 1956 through 1958, the acreage-reserve portion of the soil bank offered farmers higher payments on one-year agreements to stop growing designated surplus crops such as cotton, corn, rice and wheat.

At the other end of the scale are Government surplus-disposal programs. Most of these are based on the simple fact that supported American prices are higher than world-market prices for most crops. Cotton, for example, sells on the

Throughout the western wheat regions of the United States, long lines of Government storage bins form a characteristic feature of the spacious landscape.

USDA

supported American market for about six cents a pound more than buyers will pay in other countries. Domestic mills and exporters cannot buy for less than the support price because farmers can always put their crops under a support loan if the market offers less.

Since about one third of all United States cotton goes to export markets, the Government pays an export subsidy. This is, in effect, a refund of part of the market price. With this subsidy in his pocket, the exporter can then make overseas sales at a competitive price. More spectacular and better known is the so-called "Public Law 480" program, begun in 1954. Under this program the Government has sold billions of dollars worth of surplus wheat and other crops to countries that do not have the hard dollar currency they need to import food and fibers. In return for these shipments, the Government accepts foreign currencies. Most of the rupees, yen and other foreign money received in these sales are loaned or granted back to the customer countries for economic development. Some of the money goes to pay for United States Government expenses abroad or for promotion of long-term markets for American crops.

Despite all these efforts to keep the farm economy healthy, farm income declined through most of the post-Korean war years. The farm price-support program had reached a crisis stage by 1960. In mid-1960, the Government's stockpile of crops acquired under support programs stood at nearly $9,000,000,000 and apparently was still growing. Farm leaders in both political parties agreed that drastic changes were needed but they could not agree on what should be done.

Some changes have already been made. When the Eisenhower Administration took office in 1953, Government supports for basic crops such as wheat, corn and cotton were fixed by law at 90 per cent of the "fair earning power" parity price. Under this plan, Government economists first figured the parity prices. Parity is calculated by a formula that takes into account the cost of things that farmers buy. This produces a price at which each crop will have a "fair" purchasing power. The next step was to take nine tenths of parity and declare that to be the support price.

Agriculture Secretary Ezra T. Benson believed that this system set prices so high that farmers were automatically induced to overproduce. Under the influence of Secretary Benson and the President, support prices have gradually been reduced. By 1960, supports for wheat and cotton were down to 75 per cent of parity and corn was down to 65 per cent.

The growth of surpluses and the decline of farm income was not halted by these changes. But stocks of cotton were headed down and pro-Administration experts believed that the growth of feed grain surpluses might soon be stopped. Wheat was regarded as the key to the over-all farm-surplus problem. And Secretary Benson, maintaining that changes so far have been too small to have real effect when coupled with relatively weak controls, had called for a new policy. He proposed ending or easing production controls while dropping support prices to a point at which they would not induce farmers to overproduce.

Anti-Administration farm leaders believed that this no-control approach was all wrong. They thought that the answer lay in strong controls to tailor farm marketings to the actual needs of domestic and overseas markets. These needs would include the export of more food on easy terms or grants to needy nations in underdeveloped areas. With strong controls in effect, these leaders believed that the Government could safely offer higher support prices to bring up farm income.

The battle between these two farm support theories, waged all through the later years of the Eisenhower Administration, had resulted in complete stalemate by 1960. Which route the nation chooses in the future depends partly on future political decisions, partly on the ability of farm-belt politicians to come to terms with the city legislators whose power in Congress grows as the farm population steadily declines.

UNITED STATES
AND CANADA

THE BEATS

By WAYNE LAWSON

IN the last ten years, a group of shabby young individuals who like to be known as the Beats have attracted considerable attention to themselves in the United States. Like the American Communists of the 1930's, the Paris existentialists of the 1940's and England's Angry Young Men of recent years, the Beats are conspicuous because they deliberately break every rule and ridicule every aspiration of the normal "good" citizen of their society.

It is easy to recognize the Beat. He has developed a fairly standard uniform, a pretty rigid set of tastes and a small, strict vocabulary which serves him in describing anything and everything. He is likely to wear dungarees, sandals and a black turtle-neck sweater. He was formerly given to beards, but recently beat imitators have started wearing beards and so the true Beat has shaved his off.

The Beat prefers to live in beat communities. Such communities are usually in the free-and-easy, Bohemian sections of large cities. Favorite locations are the North Beach area of San Francisco, Venice West in Los Angeles and Greenwich Village in New York. The furnishings of the Beat's "pad" are standard: a bare mattress, crates that serve as tables and bookcases, a hot plate and a few pans, a phonograph and loud-speaker and a typewriter. Lighting is provided by bare bulbs, or candles stuck in wine bottles.

Actually, the costume and habitat of the Beats are very little different from those of that eternal cliché, the Bohemian artist. It is in his tastes and ideas that the Beat is, to a degree at least, original. The Beat is in revolt against society. He wants to be an outsider. More properly phrased, he wants to free himself and "bug the Squares." This is a packed sentence and certainly wants clarification, for it is at the very heart of beat thinking.

We—you and I—are the Squares. A person is square if he hopes to advance in a career, marry and settle down in a comfortable home. A person is square if he openly expresses love of family, country and church, or if he approves of television or almost any other creation of modern scientific technology. In short the honest, average man is square; and he is square because he goes along with his age, because he is conscientious about his politics as well as his personal ethics, because he feels that he can improve himself along conventional lines, but mainly because he is not "hip," or beat.

It is from being square in any way that the Beat, or Hipster, wants to free himself. It is from the present-day world, which he thinks is futile and doomed and meaningless, that the Beat sets out to escape.

These definitions are admittedly simple. But their implications are clear. If the Beats have found a foolproof salvation, then there is the remote possibility that our society is in danger of being outmoded and overturned by them. If not, then they are merely a small group of malcontents and their movement in time will peter out as so many like it have done in times past.

In order to decide which of these alternatives is likely to come to pass, it is worth investigating the beliefs and mores of the Beats. It is already apparent that the Beats feel that our society is dull, empty and dying if not dead. They feel, as a result, that any escape from that society is good.

Their heroes are the bums, "winos," "junkies" (drug addicts) and jazz musicians. Beats admire the Negro because he is discriminated against and because he has made the glorious contribution of a floating, forlorn, hypnotic form of jazz which they consider the art counterpart of being "gone," or "high," on wine, marijuana or whatever.

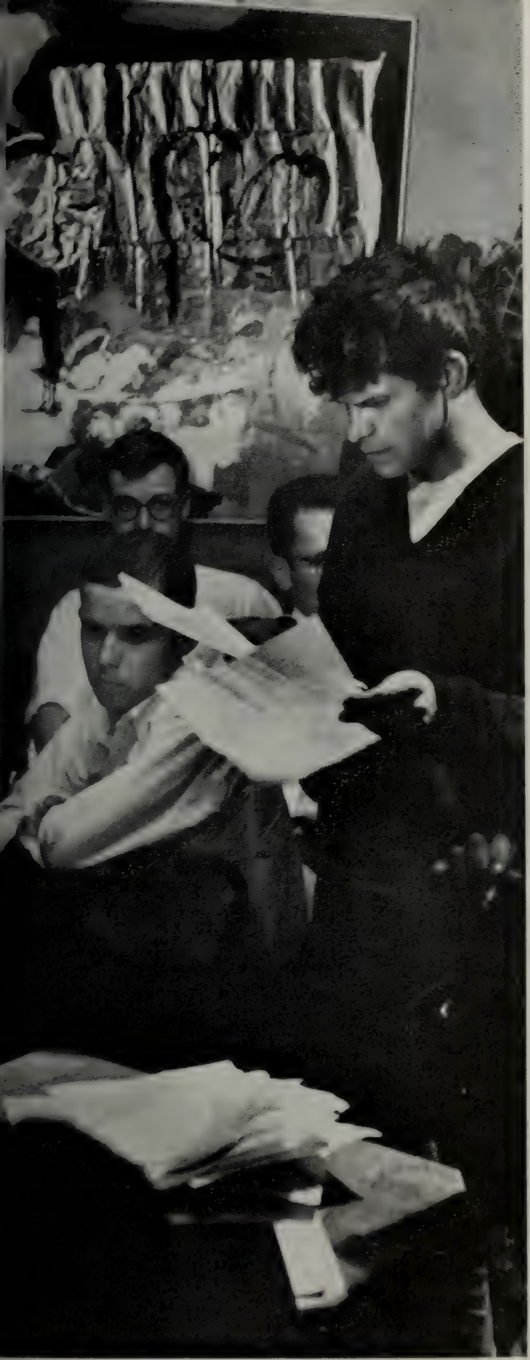
The words "gone," "high" and "swinging" are frequent in beat lingo. They denote a state of complete detachment, of perfect release, from the square world. The Beats liken this state to that reached by those whom they call the Zen "lunatics" in the Japanese religion of Zen Buddhism. Zen itself is actually a religion based on strict discipline, a striving after perfect holiness and an intuitive insight into truth and the ultimate nature of things. The word "Zen" means "meditation" and the Zen Buddhists believe that they can escape from the crassness of the material world through meditation on and identification with the eternal reality. The Beats are hardly willing to undergo the rigors of Zen or any other religion. They really only substitute a drugged state for one of religious mysticism. The best that can be said is that they "dig" Zen—that is, they appreciate it. They don't find Zen square.

Such are the things that take up the Beat's time and occupy his mind. Since he abhors anything as conventional as a job, he has plenty of free time. He may spend it talking in espresso coffee houses, listening to jazz records or hitchhiking around the country. What is certain is that the Beat's life—however uncomfortable or lacking in nutrition it may be—is very far from exhausting or even productive. That is why the Beats are no danger to normal society. Their revolt is too negative. They have nothing very alluring with which to replace the society they condemn.

To say that the Beats are unproductive is in a sense misleading. The small nucleus of beat writers who are responsible for the whole craze have produced a fairly sizable literature and have made a very handsome income from it. Their names are known to the most ardent Squares and their methods of artistic creation are well worth discussing. Most serious writers in America consider the literary Beats to be young men who have lost their erasers. On a TV panel discussion, Truman Capote described them as "typists, not writers!" But to the average Beat their work is gospel.

At the top of the heap is novelist and short-story writer Jack Kerouac. Onetime football player for Columbia University, later filling-station attendant, sports writer and railroad brakeman, Kerouac settled down in San Francisco in 1949 and began writing his novels of disillusionment and frustration. It was Kerouac who coined the phrase "the Beat Generation" for the young men in the land who felt "done in" by a smug, arid society. His best-known novels are *On the Road* and *The Dharma Bums*. He says that he never rewrites a word. He just sticks a roll of paper in the typewriter and bangs out eight or ten feet of words a day. His style amounts to a relaxed narration in "hip" language of his personal experiences.

In 1953 a group of Kerouac's friends joined him in San Francisco. Public



PHOTOS, BURT GLINN—MAGNUM

Beat poet Gregory Corso—who claims that he cannot recall ever combing his hair—reads from his works at the Seven Arts Coffee Gallery in New York City.

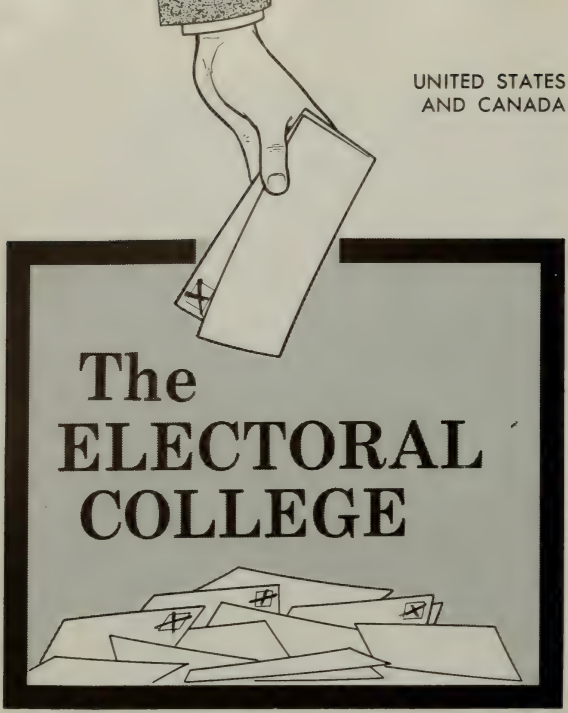
awareness of beatdom dates from that year. In this group was Allen Ginsberg, the poet, who is probably the most talented of the Beats. His little book *Howl and Other Poems* has sold over 33,000 copies. "Howl" is a nightmarish catalogue of the horrors of the modern world and a frank catalogue of the Beats' attempts to escape this modern inferno. It is not a pretty poem by any means. And yet it is perhaps the best beat work to date by literary standards.

Ginsberg and other beat poets began the craze for public readings of their works. The readings began in coffee houses and jazz places on the West coast. According to report, they are often feverish affairs. At the height of one of them, Ginsberg undressed completely to demonstrate Nakedness.

Other beat writers include Gregory Corso, Philip Lamantia, Mike McClure, Clellon Holmes, Lawrence Ferlinghetti, William S. Burroughs and many others. Several anthologies of their stories, poems and essays are available. One is called *The Beat Generation and the Angry Young Men*, edited by Gene Feldman and Max Gartenberg. More recent is *The Beats*, edited by Seymour Krim.

In addition to published works and public recitations, the Beats have also made a movie. It is called *Pull My Daisy*, is narrated by Jack Kerouac and stars, among others, Allen Ginsberg and Gregory Corso. It is something of a joke—loose, formless, perhaps half serious. It has the same careless, silly and sardonic touch that characterizes the Beats' printed matter.

And there is not much more to say about the Beats. They are in revolt against the Squares. Meanwhile the Squares think little or nothing of the Beats. They give them the foolish, derisive name of Beatniks. Many people feel that the beat craze is almost finished. Many Beats feel it has scarcely begun. However, whether the Beats are approaching the heights or whether they are on their last legs, their influence and their art do not amount to much. Whether they were angry at America, Americans, the world or themselves when they began the whole new Bohemianism, we may never know. Unless they produce something more universal than they have so far, no one will care.



The ELECTORAL COLLEGE

By ROBERT VERMILLION

Correspondent, NEWSWEEK

OF all the institutions of government provided for in the Constitution of the United States, the electoral college is the only one that has been attacked from the moment of its first real test. According to its critics, it is unfair, archaic and unnecessary. It can elect, and a few times has elected, as president of the United States a candidate who has not received the greatest popular vote.

As the electoral college operates today, its purpose is to determine, from the popular vote, which candidate shall be president. The college is now made up of panels of electors chosen in each state. Each of the two major parties in each state draws up a slate of candidates for the electoral college. The number of electoral candidates on each slate corresponds to the state's quota of representatives and senators in Congress. After the popular vote has been cast in a presidential election, the electoral group representing the party of the winning candidate in each state meets in Washington to cast its vote. Until this is done, the president has not been officially chosen.

The college was set up originally because many of the founding fathers frankly doubted the ability of the people to elect wisely. They decided that presidents should be finally chosen by electors so that they could, after serious deliberation, select the man whom they considered most suitable.

Thomas Jefferson and the men who shared his political beliefs felt that the electoral system would serve still another important purpose. It would, they believed, place the power of presidential election in the hands of the states and thus protect the country against any threat of undue concentration of power in the central executive branch. Ironically, Jefferson was the first presidential candidate to suffer from the electoral-college system he so greatly favored.

In 1796, when Washington was ending his second term and had refused to run again, political parties were just beginning to be important. There were no formal party nominations, but party leaders in the various states consulted with each other as to their preferred candidates. At that time only one panel of electors was chosen in each state and each elector was more or less understood to favor a particular candidate or, actually, two candidates. Each elector voted for two men. The one receiving the greatest number of votes became president and the one with the second-greatest number, vice-president. However, to count legally, the totals of votes for the winners had to be cast by a majority of the electors. In case of a tie, the House of Representatives would choose, with each state representation casting one vote.

The Republicans (today's Democrats) in 1796 were backing Jefferson and Aaron Burr for president and vice-president, respectively. The Federalists (today's Republicans) supported John Adams and Thomas Pinckney. The candidates were vying for 276 electoral votes. When the counting was over, Adams had 71 votes and became president; Jefferson, with 68 votes, was elected vice-president. There was a scattering of 137 votes among eleven other men. The electoral-college system had already failed to reflect the true will of the voters. (At that time suffrage was restricted to white, male citizens who owned a certain amount of property.) In Virginia and North Carolina, where the popular vote was overwhelmingly for Jefferson, an elector in each state exercised his independence and voted for Adams instead. In Pennsylvania, one elector's vote was diverted to Adams. Had those three votes gone to Jefferson, he would have become the second president of the United States.

It may be noted, also, that the electoral system, as it was then practiced, resulted in that year in the election of a president of one party and a vice-president of another.

In 1800, Jefferson and Burr were again opposing Adams and Pinckney. Republicans were in the majority in the electoral college that year and cast their two votes apiece for the Republican candidates. Jefferson and Burr received seventy-three votes each. As a result of the tie, the House of Representatives had to choose which of the running mates was to become president. House balloting was so close that Jefferson might well have lost the presidency to Burr.

This situation resulted in the passing of the Twelfth Amendment to the Constitution, which removed the possibility of a tie between two candidates on the same ticket. It provided that, in the future, electors would vote separately for president and vice-president.

Even after the two-party system was well established, the electoral college demonstrated its capacity for upsetting the expressed will of the people. In 1876, Samuel J. Tilden received more popular votes than Rutherford B. Hayes, but Tilden received fewer electoral votes and thus lost the presidency. Again, in 1888, Grover Cleveland received 5,540,050 popular votes and Benjamin Harrison only 5,444,337, but Harrison won 233 electoral votes and Cleveland only 168.

These more recent examples of elections in which electoral votes would seem to run contrary to the popular vote-count are the outgrowth of the system under which the presidential candidate who wins in a state by even one popular vote gets the entire electoral vote for that state. The Cleveland-Harrison election is a classic example of how this works. In that contest, Harrison received 650,338 votes in New York State against Cleveland's 635,965. Harrison, despite the narrow margin, won all of the state's 36 electoral votes. In Georgia, Harrison received only 40,453 popular votes to Cleveland's 100,472, giving Cleveland that state's 12 electoral votes. While the combined popular vote of those two states gave Cleveland 45,646 votes more than Harrison, the latter received 36 electoral votes, Cleveland only 12.

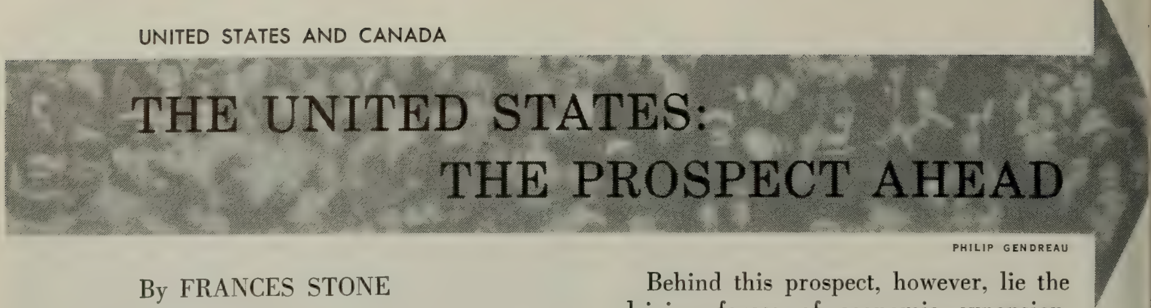
There have been no such reversals in recent years but the electoral count still can be misleading. In 1956, when General Dwight D. Eisenhower apparently overwhelmed candidate Adlai Stevenson by 457 electoral votes to 74, the popular vote was 35,582,236 for Eisenhower and 26,028,887 for Stevenson.

Two methods of correcting the situation have been proposed and taken up in Congress. One would simply abolish the electoral college and let a count of all Americans determine who shall be president of them all. The other would apportion the electoral votes of each state according to the number of votes each candidate received in that state.

In 1950, the Senate passed the proportional voting plan, but the House rejected it. In 1955, a plan was proposed in the Senate whereby, if a state preferred, electors would be apportioned to candidates just as congressmen and senators are elected. Thus, a candidate winning most votes in a given congressional district would be awarded an electoral vote. The candidate getting the most votes in the state as a whole would get two electoral votes in addition. This scheme had a good chance until it was killed by changes which complicated it.

There appears to be no strong inclination in Congress to change the system now or ever—unless an election produces a situation which attracts new attention to its faults.

THE UNITED STATES: THE PROSPECT AHEAD



PHILIP GENDREAU

By FRANCES STONE

Economic Consultant
AMERICAN-MARIETTA COMPANY

THE economy of 1975 promises to be enormously larger than that of 1960; its broad dimensions can be perceived in the growth trends and momentum of today's economy.

This report seeks to translate the impetus of the present into the business opportunities of the next fifteen years.

What is the outlook over the next fifteen years? Here are some of its highlights.

In tonnages and yardages of output, the economy of 1975 should be nearly the equivalent of *two* American economies of 1959. Our gross national product—the value of all the goods and services we produce—is today about $480,000,000,000. By 1975 our current rate of growth will give us a GNP, in today's dollars, of $925,000,000,000.

The rise in standards of living will be equally dynamic. Incomes should increase by 50 per cent over the next 15 years. The average American family of 1975 should enjoy an annual income of $9,400—again, in current dollars—compared with $6,480 today.

The market potentials of 1975 also offer an unprecedented outlook. For example, the aggregate purchasing power of families with incomes over $10,000 should equal the *entire* consumer market today. The demand for cement—to take an important industrial product—should more than double today's production.

These are only bench marks for the future. They emphasize the broad trends of the economy as a whole, the scope of the prospect ahead.

Behind this prospect, however, lie the driving forces of economic expansion. What are the dynamic elements which make it possible to project the future of the economy in such striking outlines?

One basic force behind this anticipated economic growth is—people.

Since the end of World War II we have added more people to the nation than in the entire preceding decades of the twenties and thirties *plus* half the 1940's. And this upward trend in births has shown no signs of leveling off. Some 4,280,000 babies were born in America last year; in 1975 the number of births is predicted to be 5,900,000.

As a result we can look forward to 55,000,000 more American citizens 15 years hence. This is an addition equivalent to all the people now living west of the Mississippi. It means that for every 3 consumers in the American market place today there will be 4 by 1975.

These impressive statistics do not fully reveal the economic impact of our population boom. Adding one customer for every 3 imparts a tremendous leverage to many areas of demand. For example, the rise in school-age population alone will necessitate a 15-year expenditure of $36,000,000,000 to provide 900,000 additional elementary and high school classrooms.

At the same time, strong emergent demands are inherent in other sectors of our growing population. By 1975 the number of young adults in America, from age 18 to 24, will have shot up to 27,500,000—a 70 per cent increase from today. These young people provide an unusually strong market stimulus. Typically, a young married couple spends 27 per cent more than the national average for automobiles, a huge 75 per cent more for television and furniture.

Meanwhile a household-forming, child-rearing population requires more living space. It will take 22,000,000 more homes to provide the additional space needed by a population of 235,000,000 in 1975. More houses must be built in the next 15 years than were built in the last 30.

Our population is not only expanding, it is moving. One family in every five in America changes its address every year. More and more of this movement has taken the form of an exodus from the crowded cities into the airier suburbs, where about 70 per cent of all new home construction now occurs.

These new suburban communities not only need to be built from the ground up, they must also be built from the ground down. A hundred thousand shopping centers, 1,000,000,000 feet of sewer pipe must come into being with the 15,000,000 new homes to rise in the suburbs.

A growing people, creating new communities, achieving higher standards of material well-being, generates a tremendous pressure of demand. It is a powerful force behind the impetus of the American economy.

The second great driving force behind our economic growth is technology.

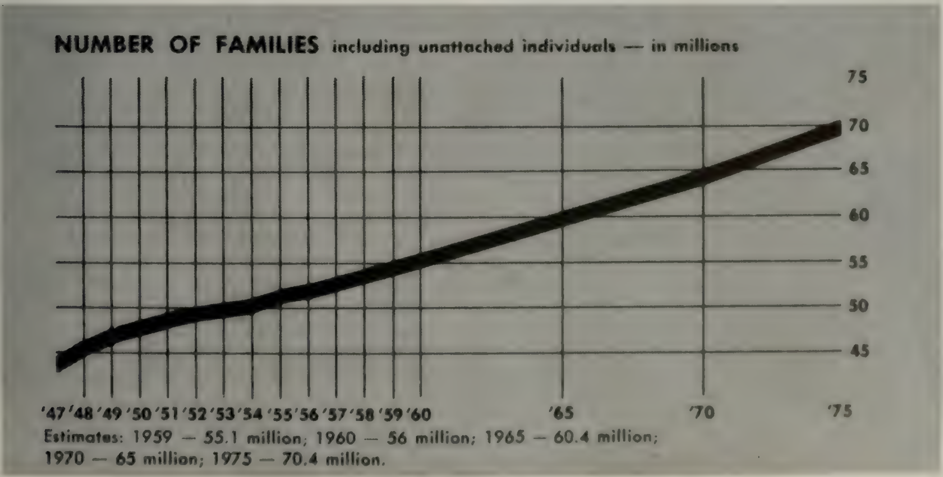
We live in an age of breath-taking technological progress. It comes as a shock to realize that the average American after World War II had never seen a television screen, never bought a package of frozen food, never had his laundry washed with a nonsoap detergent, never entered a glass-walled building. And these “revolutions of the commonplace” have been capped by our penetration to the core of the atom and to the shell of outer space—achievements without parallel in the chronicle of human adventure.

Yet this age of technological discovery is not over. On the contrary, every indication points to the fact that it has just begun.

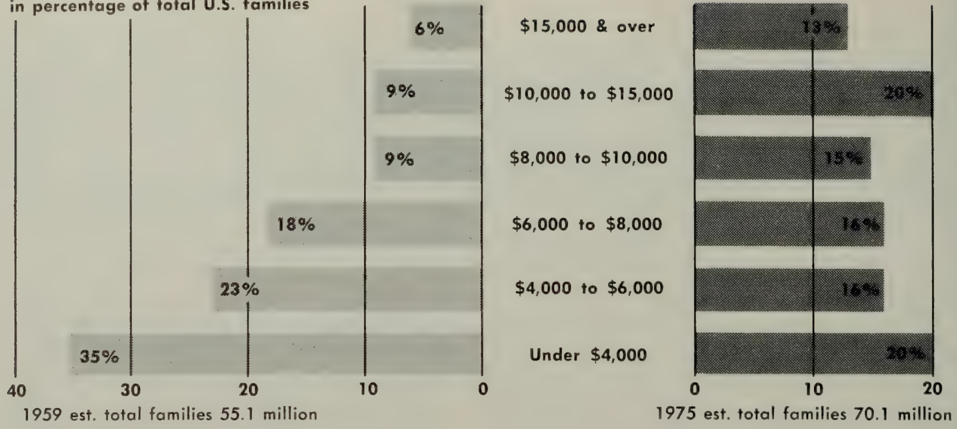
Behind the soaring curve of technological advance lies the impulse of research. Research is now so integral a part of business that we often overlook how recently we have begun to explore the frontiers of knowledge in a systematic fashion. Half of the $85,000,000,000 spent on research and development in the United States since 1941 has been spent in the last four years.

The trend of expenditures for research continues to angle sharply upward. In 1949 less than $3,000,000,000 was spent; last year that figure had increased more than fourfold; by 1975 it is likely to have passed $25,000,000,000 a year. Over the next fifteen years American business and government will spend over $250,000,000,000 just to discover and perfect new products and processes.

This huge effort—itself only a portion of a world-wide exploration—represents the greatest organized assault upon the unknown that society has ever undertaken. The discoveries of the coming years are certain to give rise to new industries with as rapid development as the 14 per cent annual growth rate of plastics and resins, the 27 per cent growth rate of synthetic fibers.


NUMBER OF FAMILIES including unattached individuals — in millions

Estimates: 1959 — 55.1 million; 1960 — 56 million; 1965 — 60.4 million; 1970 — 65 million; 1975 — 70.4 million.



DISTRIBUTION OF FAMILY INCOME
in percentage of total U.S. families

Equally dramatic as the impact of technology on industrial growth will be the effect of new techniques, more efficient tools in raising productivity and standards of living. Today the average family income is $6,480. By 1975 the trend of technological improvement points to an average family income of $9,400. A full third of the 70,000,000 families of that year should earn incomes of $10,000 and over.

This upward movement represents not only a bigger but a dynamically upgraded consumer market. Today the basic essentials of food, clothing and shelter absorb $165,000,000,000 of annual consumer spending. Fifteen years from now this market for essentials will have grown to $274,000,000,000—an increase of nearly 70 per cent. Meanwhile consumer expenditures for "discretionary" items—for personal and medical care, appliances, recreation and luxuries—will have raced on ahead, from $145,000,000,000 today to over $300,000,000,000, a rise of 107 per cent.

A nation one-third larger in customers, 50 per cent richer per customer, presents unprecedented market opportunities. The growth in purchasing potential to 1975 is a tremendous stimulus for our continuing economic advance.

The third source of our economic momentum is building. Growth in an industrial economy means new plants and equipment for industry; houses for people; schools and universities for youth; laboratories for research; roads, airports, pipelines and a thousand other structures for the multiplying tasks of daily economic life.

Over the past ten years industry has poured a record $290,000,000,000 into one vital sector of building—plant and equipment. Great as it is, that rate of capital expenditure will not suffice to meet future needs. Over the next ten years more than $450,000,000,000 must be added to plant and equipment to meet the imperative demands of population growth and technological advance.

As fast as the nation's capital equipment grows, the need for power to operate that equipment grows even faster. Since the end of World War II electrical power use has been climbing at the unprecedented rate of 9 per cent a year. Every year, on the average, we have been adding the electrical output of a Hoover Dam and a Grand Coulee combined. Total output of electrical power has skyrocketed from 307,000,000,000 kilowatt-hours in 1947 to 790,000,000,000 today.

Yet present electrical capacity falls far short of what will be needed in fifteen years. By then consumption of power will necessitate annual expenditures for utility plant and equipment double that of 1959. Demand for electrical energy flowing from the economy of 1975 will require an output of 2,200,000,000,000 kilowatt-hours.

A second source of building demand stems from the pressures of expanding population on the nation's available structures. In the suburbs alone, over $400,-

000,000,000 of residential construction will be needed during the next 15 years. Within the cities the reconstruction and renewal of huge areas open another market for construction materials. Across the United States some 246 urban renewal projects are now under way to provide public and private housing, commercial and industrial facilities, streets, schools, parks, playgrounds and utility systems costing $2,560,000,000. By 1975 the pace of urban renewal may have accelerated as much as 10 times.

A construction demand of no less importance comes from the nation's pressing needs for water. Per capita use of water, already at record levels, will rise by a third in 1975—a demand made still more urgent by the one-third increase of population. Meanwhile industrial use is rapidly growing: water use by chemical industries alone promises to double or triple in fifteen years.

By 1975 the nation's total water needs will have mounted to a torrential 450,000,000,000 gallons—50 per cent more than today. For optimal use of the nation's water resources, an estimated $214,000,000,000 in water-facilities construction would be required. Of this amount, public sewer and water-system expenditures will total at least $30,000,000,000 over the next 15 years.

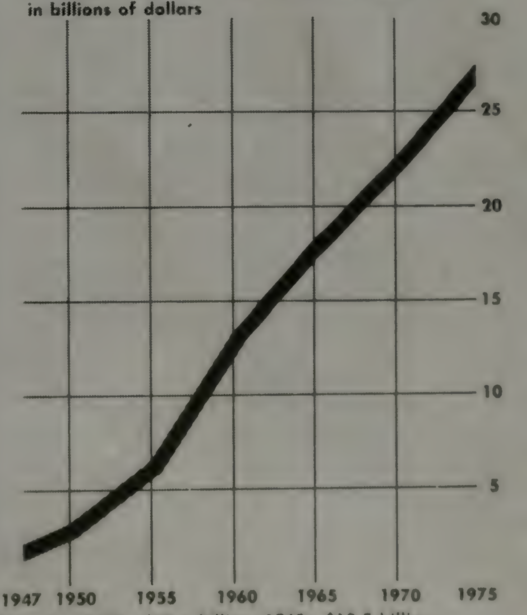
Another urgent source of building demand comes from the nation's highway needs. Over the past 12 years the number of vehicles on our roads has doubled; by 1975 the number will rise from today's 71,000,000 to 111,000,000. To date, however, the number of added highway miles constructed has increased by only 4 per cent since World War II.

Through the Federal Interstate Highway System we have begun to solve this looming traffic problem. Already the cost of this road network has been estimated at $40,000,000,000. These expenditures will exert a tremendous force on many sections of the construction industry. For every $1,000,000,000 of highway construction, 93,000,000 tons of aggregates, 17,000,000 barrels of cement, and 500,000 tons of concrete pipe are required. To supply the anticipated needs of the Federal Interstate Highway System alone will absorb twice the present annual output of the entire United States cement industry.

These demands indicate some of the main dimensions of the building program ahead. During the next fifteen years, our economic growth will require spending the enormous figure of $1,540,000,000,000 for construction materials, services and labor. In itself this will constitute one of the major forces of growth within the economy.

People, technology, a tremendous demand for building—these are the dynamic forces in the American economy today. Together they project the widening dimensions of the economic future.

TOTAL RESEARCH EXPENDITURES
in billions of dollars



Estimates: 1959—$12.4 billion, 1960—$13.5 billion; 1965—$18.3 billion; 1970—$22.5 billion, 1975—$27.8 billion.

Editor's note: *We are greatly indebted to the officials of the American-Marietta Company of Chicago, Illinois, for their permission to reprint part of their copyright booklet, "The Years Ahead: 1960 to 1975," and for permission to use adaptations of some of the charts contained in that most interesting publication.*

The Three-Mile Limit

NATIONAL FILM BOARD OF CANADA

A two-masted Newfoundland schooner speeds along toward the fishing grounds on the Grand Banks.

By A. M. FRASER

Provincial Archivist of Newfoundland

FOR centuries the prescribed limit for territorial waters has been recognized as 3 nautical miles. This means that any country has jurisdiction over and complete and sole rights to fishing and other activities in the waters stretching 3 miles outward from its shores. No other country can encroach on those waters without official sanction. The three-mile limit was originally agreed upon because of the belief that 3 miles was the greatest possible range of a cannon shot. As one distinguished jurist put it, "The dominion of the land ends where the power of its arm ends."

In recent years, however, countries such as Iceland, which have valuable offshore fisheries, have been demanding an extension of the limit to 12 miles. They have contended that the present limit no longer gives their coastal fisheries adequate protection against foreign fishing vessels. They believe that the traditional three-mile limit is not realistic today. On the other hand such nations as the United Kingdom, Portugal and the Netherlands, which carry on important fishing activities in international waters (all waters outside the three-mile limits of the various countries), wish to preserve the status quo.

In April 1960 the second Conference on the Law of the Sea was held in Geneva, Switzerland, under United Nations auspices. At this conference, Canada and the United States came within an ace of achieving a radical change in the long-established principle of international law governing national sovereignty over coastal waters. The two countries proposed a compromise between the three-mile limit and the twelve-mile limit. Actually, this was a compromise within a compromise, for it was a United States modification of an earlier Canadian compromise effort. Sponsored jointly by the two countries, it was based upon a "six-plus-six" formula. It proposed that the limits of territorial waters should be extended from 3 miles to 6; that beyond this new six-mile limit each country should, after 10 years, have exclusive fishing rights within an additional 6 miles from its shores, making 12 miles in all. The compromise also proposed that, pending the expiration of this ten-year period, the fishermen of any nation who had traditionally fished within 12 miles of another country's shores should be allowed to continue to fish in those waters up to the new six-mile limit. This proposal represented substantial concessions by both the United States and Canada.

The question was raised initially at the first United Nations Law of the Sea Conference at Geneva in 1958. The United States then, for strategic as well as fishery reasons, at first held out for the three-mile limit. The extension of territorial waters to 12 miles would have deprived

American fishermen of their historic rights off both the Atlantic and Pacific coasts of Canada. The importance of these rights may be gauged by the fact that the annual catch of halibut and salmon by United States fishermen off Vancouver Island alone has an estimated value of $40,000,000. Even more serious, from the United States standpoint, was the restrictive effect that the twelve-mile limit would have on the maneuverability of the United States Navy. The imposition of this limit would mean that 116 international straits throughout the world would become subject to national sovereignty. Of these, eighteen would be under the control of nations that might obstruct the movements of warships and aircraft of the United States and its allies. In this connection it was significant that Russia was one of the most vigorous advocates of the twelve-mile limit.

The opposition of the United Kingdom to the twelve-mile limit also stemmed in part from defense considerations but principally from her concern for her fishing interests. Indeed, for the past 2 years she had been involved in a bitter controversy with Iceland because of the latter's attempt at unilateral enforcement of the twelve-mile limit against British trawlers.

Canada, on the other hand, was at first in favor of a twelve-mile zone from which foreign fishing vessels as well as foreign warships would be excluded. She wished to protect her halibut and salmon fisheries off her Pacific coast and her cod fishery off her Atlantic coast. Canada has always tried to reserve her inshore fishery for smaller vessels. Canadian law forbids large Canadian trawlers and draggers (over 65 feet) to fish within 12 miles of Canadian shores. Since Canada has no jurisdiction over foreign vessels beyond the three-mile limit, Canadian fishing crews have had to watch helplessly while foreign trawlers of equal size pursued fish into the twelve-mile zone from which the large Canadian vessels were themselves excluded.

However, while Canada wished an exclusive fishing jurisdiction of 12 miles, she had no desire to press her claims to territorial waters beyond 6 miles. Hence the original Canadian compromise proposed a "six-plus-six" formula that would have extended territorial waters from 3 miles to 6. In addition it would have immediately prohibited all fishing by foreign vessels within a further 6 miles—12 miles in all.

The first part of the Canadian proposal was acceptable to the United States because it went a long way toward meeting American strategic requirements. The six-mile limit for territorial waters would close only 52 international straits as compared to the 116 that would be closed by the twelve-mile territorial limit. Of these, only 11 would be subject to the control of nations that might interfere with the movements of her navy and air force: 2 off Siberia, 2 off Communist China and 7 in Indonesian waters. The United States, however, objected to the second part of the Canadian plan—the twelve-mile exclusive fishing limit. This difference was bridged, however. Following lengthy negotiations, Canada and the United States agreed to cosponsor a further compromise that modified the original Canadian proposal by inserting the ten-year adjustment period previously mentioned.

Unfortunately, however, the joint resolution failed by one vote to obtain the required two-thirds majority with the result that the three-mile limit remains in force.

The joint action of Canada and the United States, nevertheless, demonstrated the willingness of these two countries to co-operate on an international question in which their interests are not in all respects identical.

Editor's Note: *The three-mile limit also made news within the United States during 1960. The Federal Government contested the ownership of underseas resources by states on the Gulf of Mexico. A Supreme Court decision on May 31 awarded to Texas and Florida underseas rights out to 10.5 miles from shore, but to Louisiana, Alabama and Mississippi, rights out only to 3.5 miles. The latter states and the Federal Government disagree as to the actual boundaries involved.*

AUSTRALIA—Business Frontier

AUSTRALIAN NEWS AND INFORMATION BUREAU

Sydney, on the shores of Port Jackson, might well be called "the Australian New York," for it is the main commercial and cultural center of Australia.

By R. M. YOUNGER
Journalist and Author

AS the 1960's began, nowhere was the business boom greater or the prospects brighter than in Australia. A sustained development program has for years been changing the face of the island continent. New resources are being tapped in a spate of expansion that has lifted the output of farm products, minerals, power and manufactured goods and has made possible an increase in exports.

Australians now enjoy a standard of living lower only than that of the United States and Canada. The value of retail sales in 1959 was higher than ever before. Installment buying was at record levels, and the number of new motor-vehicle registrations reached an all-time peak. By the beginning of 1960 there was one motor vehicle on the roads for every 3.8 persons. Consumption of petroleum products increased about 6 per cent in 1959. Television sets were being sold at the rate of 320,000 a year, and radios at the rate of more than 400,000. At the same time, savings-banks deposits reached a total equivalent to $3,200,000,000—an average of well over $300 a person for the entire population. In the next few years there will be a rapid growth in the number of people reaching adulthood. This will further strengthen demand for houses and for all types of home appliances and other equipment.

Pacing the business boom in Australia are many American companies. They are producing items as diversified as elevators and detergents; brand names that have long been household words in the United States are almost equally familiar to Australian shoppers. Retail innovations, from drive-in shopping centers and supermarkets to automatic vending machines, have appeared in increasing numbers in the wake of prepackaged foods and pressure-packed toiletries.

Australia's 10,111,284 people (as of September 30, 1959) are almost entirely of European stock and mainly British in origin. They are concentrated in the fertile crescent and other areas in the southeast of the continent and on the island of Tasmania. About one third of the commonwealth's area of 2,974,581 square miles supports no economic activity because of lack of rain (under 10 inches and even, in some places, under 5 inches a year), and another one third is too dry to support more than the sparsest population. Yet, in spite of this, Australia boasts two very large cities: Sydney has a population of 2,054,800 and Melbourne has 1,777,700 (both figures as of June 1959).

During the 1950's the national income went up two and one half times—from $4,500,000,000 to more than $11,200,000,000. Rising prices forced up the minimum wage from $18 to $32 a week. Overseas trade rose dramatically—in exports from $1,200,000,000 to $1,800,000,000 and in imports from $933,000,000 to $1,700,000,000.

There have been other phases of expansion in Australia's history, but few have been so prolonged. None has been so widely spread throughout the economy as that which began after World War II and gathered real momentum in the early 1950's. Only minor lapses have occurred and these have been so brief and so mild that they have not disturbed the general upward trend in production, consumption and international trade. Throughout, unemployment has been negligible.

The pattern of activity is remarkably close to that of the United States. As in the United States the trend has been for the number of people engaged in farming and other rural activities to decline. This, coupled with steady growth in manufacturing, has meant that the percentage of the rural work force has fallen sharply from 25 per cent thirty years ago to about half that percentage today.

As 1960 opened, Prime Minister Robert Menzies declared that the nation would continue to prosper and added: "As Australians, we know our country has been built on work, skill and friendliness. We have immeasurable talent for these three great gifts, and, so long as we use them to our fullest extent, our future will be secure."

There were clear signs of the maturity of the economy in the Government's decision to relax remaining import restrictions. Solid export earnings, plus a big inflow of money to establish new businesses, made this possible. A licensing system to control the level of imports had been operating for eight years when, in February 1960, 90 per cent of controlled imports were freed. There was no longer any discrimination between sources of supply and, as a result, dollar goods became freely available for the first time in twenty years.

A traditional feature of the Australian economy has been the large surpluses of foodstuffs and raw materials—mainly wool—that were available for export. These surpluses have accounted for the major part of overseas earnings. During the past few years, expanded manufacturing activity and diversified exports have combined to bring new strength to the economy, and this has been reflected in growing business activity.

Since the end of World War II a sustained immigration program has added about 1,500,000 persons to the population, while natural increase has been responsible for an almost equal rise. There are limitations, of course, to the extent of Australia's ultimate expansion, but these limits are still far from being reached. Over recent years the Australian average population-percentage increase has been equivalent to Canada's and well above that of the United States. Nevertheless, with only 3.3 people to the square mile, Australia remains the least densely populated nation on earth. Its closest rivals for this title are Canada, Saudi Arabia and Sudan.

The sustained postwar immigration program has helped to give Australia an annual population increase of about 2.5 per cent. It is one of the five fastest-growing countries in the world, and by 1975 its population is expected to reach 15,000,000; it is estimated that by the year 2000 there will probably be 30,000,000 Australians.

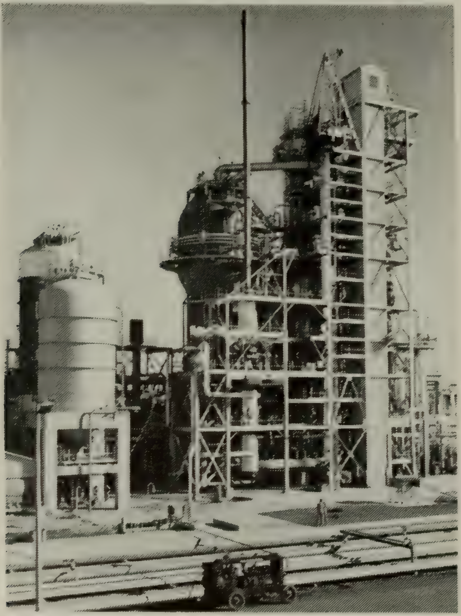
Population-building is only one phase of a national policy that has as its objective the general development of the country as fully and speedily as possible. Large-scale public works to increase power output, water storage and transport facilities are being undertaken. Business expansion is seen in the erection of great new industrial plants, in commercial building and in the introduction of new and improved machines.

Australia's factories now employ more than 1,000,000 people and produce goods worth more than $9,000,000,000 a year. In the past thirteen years factory employment has increased by about 25 per cent, and the number of factories is up from 35,000 to more than 54,000. It is estimated that actual output has nearly doubled in the same period. In addition, the quality of products flowing from the factories has been improved and their variety has increased. Among these products are jet aircraft, motor vehicles of all types, synthetic fibers, petrochemicals, electronic equipment, diesel locomotives and power cables.

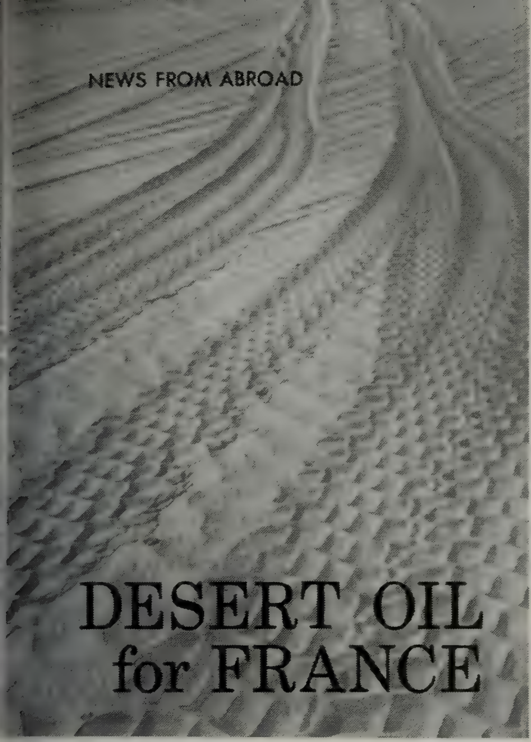
Not all industries have grown so rapidly. Those supplying the necessities of life—food, drink, clothing, footwear and so on—have more or less merely kept pace with population growth. On the other hand, the basic industries—notably engineering and the metals and chemicals industries—have grown much faster. In ten years, refinery capacity has been raised from 800,000 long tons to 11,400,000 long tons. (A long ton is 2,240 pounds.) A full-scale petrochemicals industry is being established. It seems likely that these big-growth industries will continue to expand, particularly those able to meet the diverse needs for new types of goods in a country with a progressively higher standard of living. As an illustration of the trend in business conditions, an index of factory production showed a 7 per cent rise in 1959. New and improved techniques have been introduced, and with better equipment output per head has risen.

Development on the scale undertaken over the past fifteen years has created a great demand for capital, both for business and for public undertakings. Britain remains the main outside single source of investment, but the inflow from the United States has been increasing significantly. American industrialists have noted Australia's rapid growth within a stable economic and political environment. The size of the country is very nearly that of the United States, while the rates of population and industrial expansion, as well as general living standards, are also somewhat similar. The air of confidence abroad in Australia today is unmistakable.

AUSTRALIAN NEWS AND INFORMATION BUREAU



A typical result of Australian-American financial co-operation is the giant cracking unit at the Shell Oil Company's $20,160,000 refinery in Victoria.



DESERT OIL for FRANCE

By EDWARD R. SAMMIS

Free-Lance Writer

THE Sahara, where life has changed little since ancient times, is taking a giant step into the twentieth century. Nomadic tribesmen tending their flocks are no longer startled to see airplanes skimming low over their heads. Huge sand-cruising trucks, the largest ever built, make their way by compass over the trackless wastes of sand dunes and eroded rocks. Even air conditioning has been introduced to give relief from the parching heat. All of this has happened since 1956 when oil was discovered under the wilderness of sand in the southeastern area of the French Sahara.

To France the rich new oil fields of southern Algeria give promise of prosperity and economic self-sufficiency. When the second of two pipelines goes into operation early in 1961, carrying oil from the desert fields to the Mediterranean coast, France will have moved into sixth place among oil-producing nations of the world.

The Sahara itself has a new and modern distinction. It has joined the United States, the Middle East, Venezuela and, to a lesser extent, the Far East, as one of the few oil producing-exporting areas to which industrialized nations of the Western world can look for supplies.

For the native Berbers and Arabs, life already has begun to change. For centuries they have lived in pastoral colonies around the oases, tending their goats, donkeys and camels and raising dates, or have wandered over the vast desert as nomads in search of forage for their flocks. Now many have joined *les petroliers* (oilmen)—a term which embraces all of those who have a part in finding or drilling for oil. They perform principally unskilled tasks, but gradually some are being trained for more exacting work. In the past, ambitious children of the desert headed for Algiers as soon as they were old enough to work. Now many are remaining in the desert and some who had left are returning because of the new activity.

Towns in the vicinity of the oil fields are taking on a new atmosphere. Trucks are appearing in greater numbers on the highways; garages and gas stations have sprung up. Bicycles, modern synthetic fabrics and even some electric appliances are trickling into the oasis communities. At the Hassi Messaoud oil field an air-conditioned hotel offers rooms with showers on a site where a few years ago only an old artesian well broke the lonely expanse of dunes.

Until recently it was generally accepted that the Sahara was simply wasteland. In 1927 a French geologist, Conrad Kilian, returned from an exploratory trip through the desert, certain that there were great reservoirs of oil beneath the sands. No one paid much attention to his views.

Then, in October 1945, after World War II, the provisional Government of France under General de Gaulle set up an organization called the Bureau de Recherches de Petroles (Office of Oil Research). It was assigned the task of preparing and directing a systematic search for oil reserves throughout the French

Community (this includes the departments of Metropolitan France and Algeria, its overseas departments, member states and territories throughout the world).

France needed power for reconstruction. Even by boosting output of French coal mines to the highest possible level and developing all hydroelectric sources, the nation could attain only a fraction of the power it needed. A modern nation needs a tremendous supply of power, and France had to find an economically feasible source if she was to mechanize her industry and increase productivity. To depend on imports would have been financially disastrous. A French source of oil was the only answer. Prospects for finding it were not bright, but technicians were trained, geophysical parties were organized and financing was arranged. Finally, in 1952, the search for oil in the Sahara got under way.

In January of 1956 a French Government oil company, with Shell Oil a 35-per-cent partner, hit the oil jack pot at Edjele in the eastern desert near the Libyan border.

Oil had been found, but getting it out of the earth posed a problem. Locations were remote. Lighter supplies could be flown in, but the heavy drilling equipment had to be brought across the open desert by truck. A French truck-manufacturing company, Berliet, built a desert colossus, a 100-ton truck with tire-to-ground pressure exactly the same as that of a camel's foot on the sand. Capable of transporting a 30-ton load over any sort of terrain, the desert truck is equipped with a sand-tight, air-conditioned cab complete with bunks, fresh water tanks, a compass for use in uncharted areas, two-way radio and other conveniences.

Six months after the Edjele strike, the biggest Sahara oil field to date was brought in by two French companies at Hassi Messaoud, a little over 400 miles south of the Mediterranean coast. More than 40 wells have been drilled there. Each is about 11,000 feet deep and costs roughly $1,000,000.

The year 1956 was to end with another important French discovery. At Hassi R'Mel, on the northern rim of the desert out in the middle of nowhere, an exploratory team located not oil but a natural gas field which may turn out to be the largest in the world. Its gas reserves appear to be in the neighborhood of a staggering 30,000,000,000,000 cubic feet. This reserve clearly should be ample to meet all of the needs of Algeria, with plenty left over. Plans are being considered for piping the gas across the Mediterranean, either at Gibraltar and up through Spain, or straight across to Marseilles.

These three discoveries were just the beginning. Other oil fields have been found in the desert at such places as Zarzaitine, Tiguentourine, El Gassi and El Adeb Larache. Other companies and other countries received permits to join the search in 1958, and by the beginning of 1960 about 90 geophysical crews were at work in the Sahara, moving from place to place seeking underground deposits not yet spoken for.

By that time the French had completed their first pipeline from the desert to the Mediterranean. First a 333-mile line was built from Hassi Messaoud to the port of Bougie on the Algerian coast. It cost $100,000,000 to build and was put into operation in December 1959. A second, from Edjele and nearby fields, runs to the Tunisian port of La Skirra on the Gulf of Gabès. This line, beginning operation early in 1961, extends through the desert zone for 438 miles of its 486-mile total length. Much of the route is through Tunisian territory. From Bougie and La Skirra, the oil will be transported across the Mediterranean by tanker to French refineries.

Another pipeline, planned by 19 international and European oil companies, is scheduled to open by the end of 1962. This one will carry oil from Marseilles' oil port of Lavera northward for 430 miles to proposed refineries at Strasbourg in northeastern France. It very likely will transport both Middle East and Sahara oil.

The French petroleum industry now is well under way. Oil consumption by the

Trucks that can haul loads over the soft slopes of sand dunes have been especially developed to solve problems of travel in the Sahara oil fields.

PHOTOS. FRENCH EMBASSY PRESS AND INFORMATION DIVISION

A surveyor works on the difficult task of mapping the Sahara. Loose trousers, desert sandals and an umbrella aid in combating the sun's burning heat.

↓Drilling rigs are springing up throughout the French region of the Sahara, as oil has become vitally essential to the economic health of the French Community.

French Community has reached 30,000,000 tons a year. This is double the 1950 level and six times that of 1945. Today French refineries, most of which were destroyed during World War II, have been rebuilt and expanded to such an extent that they can meet practically all of this demand and produce for export as well. In the near future the new-found African oil fields are expected to supply enough crude oil to meet domestic needs and leave a balance for export. Natural-gas production also is expected to be more than ample for French needs.

Actually the type of oil found in the Sahara is not the one most needed in France at the present time. It is ideal for making gasoline, whereas the need in France is mostly for heavy fuel oil for industrial use and middle-range oil for home heating. Middle Eastern oil is rich in heavy fuel, and the refineries now operating in France are set up to handle it.

The refining industry has saved France foreign-currency expenditure by making it possible to import crude oil rather than finished products. Now France hopes to have enough Sahara oil and oil products to sell them to other countries. If she can do that in large enough quantities, those sales would offset her own import costs for Middle East oil. This is just one way in which the petroleum industry is proving a benefit to the French economy. Many new allied industries have developed, existing ones have expanded and career opportunities have been created.

The need for a fleet of modern tankers boosted French shipyard activity; expanded refining capacity challenged the refinery-equipment industry which has provided almost all of the installations now in operation and has moved into the export market as well. Drilling equipment had to be imported at the outset of operations, but now nearly 90 per cent (in terms of value) is produced by the French.

Probably the greatest expansion has occurred in France's petrochemical industry. A mere infant before the discovery of the Saharan oil, that industry has quadrupled investment in facilities since 1957. A basic field in itself, it makes use of gases which are by-products of the petroleum-refining process. From these it acquires chemical raw materials for producing compounds used for plastics and synthetic resins, paints and varnishes, synthetic rubber, textile fibers, detergents, and agricultural products and fertilizers.

The development of the petrochemical industry, in turn, has given rise to a need for equipment, technicians, distribution and service adjuncts. The very character of the industry assures continued expansion through research.

These are direct results of the development of the petroleum industry. On a broader basis, the entire economy reacts to the development of new industries and expansion of existing ones. More people have more money to spend, so in every field there is a greater market for goods and services.

There still are many political, social and economic problems to be solved in relation to Sahara oil and its place in the world petroleum picture. These will take some time to work out.

The French Government sees in the development of the Saharan oil fields a definite bond between Europe and Africa, implying mutual responsibilities. Africa, France feels, must give the help needed for effective development of its own oil and gas resources. On the other hand, Europe must share the benefits derived from African oil by developing stable markets, improving the status and standard of living of the African worker and establishing industries in North Africa. Plans already have been made to earmark oil-royalty funds for schools and medical and social services. The French Government is drilling for water in formerly uninhabitable areas, and industries, including a steel plant, are projected for northern Algeria, based on cheap gas supplies from Hassi R'Mel.

In a broad sense the discovery of oil in the Sahara benefits all of Western Europe. It provides a measure of security that if, in time of crisis, Middle Eastern oil should be cut off, an alternative source of supply would be available.

LATIN AMERICA in 1960

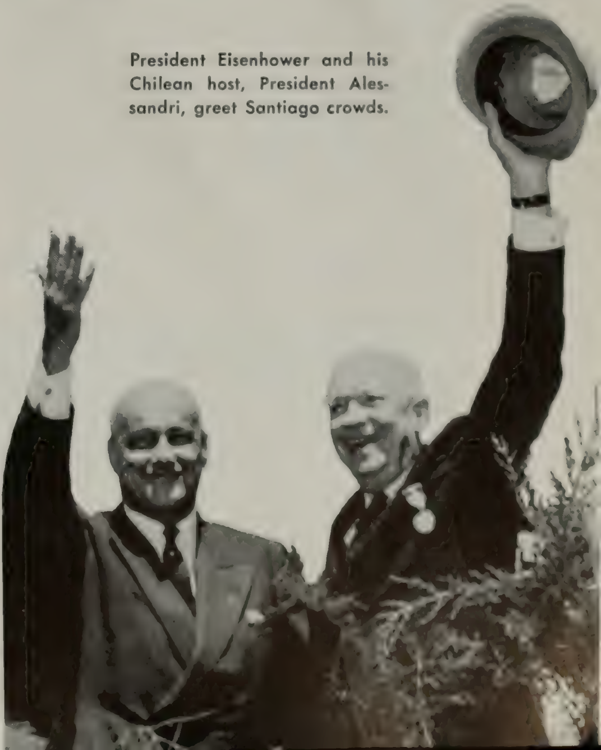
By CONCHA ROMERO JAMES
Hispanic Reference Specialist
THE LIBRARY OF CONGRESS

AS the year 1960 passed into history, it was obvious that no twelve-month period in Latin America had ever been so packed with problems, so many important decisions and so much sheer confusion along with solid achievement.

One of the most noticeable trends was a desire common to many Latin American countries to get at the roots of justifiable social unrest before it erupted into excesses and reckless disregard for human values. The demand seemed to be not for freedom as an abstract concept, but rather for opportunity to do something with it, to free the human being from the curse of stagnation and underdevelopment. Another common concern manifested in 1960, and related to the first, had to do with the practical steps that democracies must take to raise the standards of living and to promote civic pride, political morality and a sense of participation in national life. In several countries, plans are under way that call for governmental aid and also for contributions from the people, in the shape of respect for needed austerity measures and the payment of taxes according to the people's ability to pay.

From the international point of view, a serious concern of the governments has been with the presence in their own or neighboring territories of groups affiliated with the so-called "26th of July movement." This movement made the Cuban Fidel Castro a continental figure and a more-than-life-sized symbol of resistance. The main problem, according to the most responsible leaders in Latin America, is how to do away with the tremendous inequalities among the people without the excesses of the Cuban revolution.

This concern was expressed by President Juscelino Kubitschek of Brazil in a letter of July 9 to President Eisenhower, commenting upon the latter's plans for economic aid for Latin America: "The problem of Latin America is more than economic . . . and it is imperative to adopt without delay . . . a continental approach which would prevent in the future the many mistakes of the present hour, establish a path towards security, peace and social justice, and make impossible extracontinental political interventions which we must certainly resist . . . Freedom, democracy, and the dignity of man are meaningless words for the inhabitants of regions where life is nothing but a continuous sacrifice." Similar sentiments have also been expressed by other greatly respected Latin American political leaders.



President Eisenhower and his Chilean host, President Alessandri, greet Santiago crowds.

This was not a comfortable year for dictators. In the Dominican Republic, Rafael Leonidas Trujillo, seeing that the days of his thirty-year regime were numbered, retired as head of the official Dominican Party. He also caused his brother to turn over the presidency to another figurehead, Joaquin Balaguer, and removed his son Ramfis from the chairmanship of the chiefs of staff. Reportedly, the general withdrawal included the transfer of funds to foreign banks. Before these developments, the Trujillista Government was the object of a scathing denunciation by the representative of Venezuela before the Council of the Organization of American States (OAS) for its violation of human rights. The same Government was later accused by Venezuela of an attempt on the life of that country's President Romulo Betancourt. A committee appointed by the Council of the OAS to investigate both charges found them fully justified. This led to the calling of a Consultation Meeting of Foreign Ministers, which met in August in San Jose, Costa Rica, to consider these charges. The outcome was the virtual isolation of the Dominican Republic, as one after another of the Latin American republics severed diplomatic relations with it. Some considered applying economic sanctions that could have the effect of seriously crippling the economy of the country.

A similar meeting was held immediately afterward, to review the charges filed against the Cuban Government by the United States. These had been presented on June 27 to the Peace Committee of the OAS in the form of a long memorandum. The charges included disregard for the 1959 Santiago declaration which called for free elections, the violation of human rights, the persecution of Cubans disillusioned with the Castro regime, the destruction of academic freedom and freedom of the press and radio and the proscription of individuals and political parties, and so on. But the core of the memorandum dealt with the relations of the Cuban Government with the Sino-Soviet bloc. This accusation was pointed up a few weeks later with the recognition by Cuba of the Peking and North Korea governments, and by threats that Russian rockets would be ready for defense against possible United States aggression. Cuba was also accused of interference in the political affairs of Latin-American republics, with undermining inter-American solidarity and with trying to tie other countries in Latin America to the tail of the communist kite. Aside from all this was the wholesale nationalization or confiscation of foreign enterprises, most of them American, ranging from sugar plantations to industrial plants, mining interests, banks, hotels and so on.

While the Latin American delegates were united in denouncing the Dominican Government, they were divided on the problem of Cuba and no resolution mentioning it by name could be passed. The only specific sanction was directed against the interference of an extracontinental power—meaning the Soviet Union and any of its satellites or associates—in the internal affairs of American nations. While signing the declaration, the representative of Mexico, a country that went through a long and bloody revolution from 1910 into the 1920's, stated in writing that Mexico's signature did not signify lack of sympathy for the social aspirations of the Cuban people and their Government.

One of the reasons why a unanimous rebuke of the Cuban Government was not possible in San Jose was because Cuba's general objectives, if not its alliances, and methods are popular in Latin America. This is especially true among the university students, whose main extracurricular activity is militant politics.

The social and cultural aspects of the

Cuban revolution have greatly impressed many visitors—agrarian reform, the building of recreation centers, housing projects, co-operatives and an attempt at mass education symbolized by the conversion of army barracks into schools. Some governments, however, have resented the use of Cuban diplomatic missions and the visits of President Osvaldo Dorticos for propaganda purposes, as well as the extravagant Cuban radio broadcasts. Toward the end of the year the press announced that 90 per cent of all industries and other private interests had been taken over by the Government, and there seemed to be no remuneration in sight. But there was no longer a united front and defections became a daily occurrence even among the Premier's formerly loyal personal friends. An embargo placed by the United States on all exports to Cuba with the exception of medicines and food contributed to the general discontent.

Four liberal and progressive presidents were inaugurated during the year in Latin America. In Panama, Roberto F. Chiari succeeded Ernesto de la Guardia; Victor Paz Estenssoro became president of Bolivia for the second time; Jose Maria Velasco Ibarra, who had served as president of Ecuador three times previously, was elected by the largest plurality in the history of the country; Benito Nardone became president of the nine-member National Council of Government of Uruguay in March. While the election of Paz Estenssoro was expected, the triumph of Velasco Ibarra was a great surprise. He ran independently against two strong candidates, one of them American-educated Galo Plaza, former successful president of Ecuador with a wide international reputation, who was backed by a coalition of liberal forces.

Early in October, Brazil elected a new president, Janio Quadros, described as "a man with a broom" because of his successful campaign against inflation when he was Governor of São Paulo. Quadros, who ran against Marshal Henrique de Teixeira Lott, President Kubitschek's candidate, will have as vice-president João Goulart, vice-president under President Kubitschek. Goulart shared the ticket with Lott in accordance with the Brazilian electoral system that permits presidential and vice-presidential candidates of opposing parties to end up on the same team. An energetic and imaginative executive, Quadros appeals to the business community for his fiscal acumen, to bureaucracy for his administrative talent and to the multitude as a social reformer.

Brazil acquired a new capital—Brasilia—in 1960 and a new state, Guanabara, whose capital is Rio de Janeiro. Courage and vision, both of which President Kubitschek possesses in abundance, were needed to build Brasilia, 600 miles from the coast on a plateau in the geographical center of Brazil. A city built in haste and inaugurated on schedule, Brasilia became a reality barely five years after an aerial survey determined its site. Architect Lucio Costa and one of the architects of the United Nations, Oscar Niemeyer, took charge of planning the city and designing the buildings. The city is generally considered a masterpiece of plastic beauty on monumental scale. The inauguration took

Assassination attempt in Caracas, Venezuela: President Betancourt escaped from car blazing at left.

place on April 21, with the blessing of Pope John XXIII broadcast from the Vatican, and in the presence of 5,000 invited guests from all over the world and 100,000 tourists. The fiesta atmosphere was enhanced by parades, folk music and dancing, plus thirty-eight tons of fireworks. Built at a cost estimated conservatively at $500,000,000, this dream-come-true has contributed to a huge deficit of 21,200,000,000 cruzeiros (about 188 cruzeiros to the United States dollar).

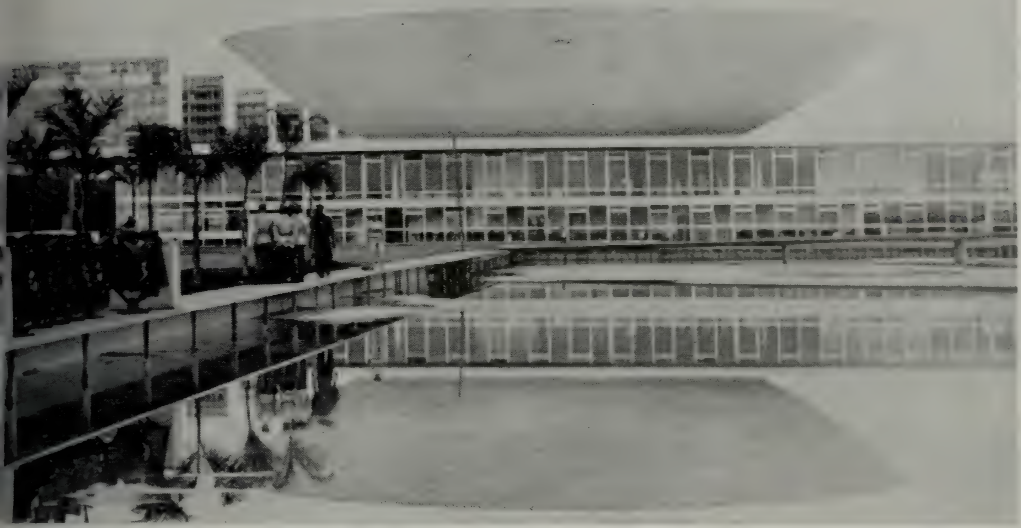
Chile, in a grim atmosphere, had the task of rebuilding bridges, port works, hospitals, schools, churches and homes in a huge area extending over ten central and southern provinces laid waste by a succession of earthquakes, volcanic eruptions and tidal waves beginning on May 21. More than 65,000 homes were destroyed and 80,000 were damaged; some 5,000 persons lost their lives and about 352,000 were left without shelter. Heavy industry and mining sustained relatively small losses, but medium and light plants were practically all destroyed. Agriculture was almost ruined through the destruction of warehouses and transportation facilities. Heavy rains caused floods that added to the general misery, alleviated only by prompt and generous help from all over the world.

Hospital equipment, medical supplies, doctors and nurses were immediately dispatched by air by the United States Government. More than $5,000,000 in cash, clothing and other necessities were contributed by Americans through the Red Cross, CARE and other agencies. Of the $600,000,000 authorized in the summer by the Congress of the United States for aid to Latin America, $100,000,000 will be devoted to Chilean reconstruction. The West German Republic offered to rebuild Valdivia, a city of 100,000, settled by German immigrants in the nineteenth century; Argentina has undertaken to rebuild Chiloe and Italy paid all the expenses of the Chilean team participating in the Olympic games. International bodies, such as the United Nations' Food and Agriculture Organization, will also cooperate, as will the Export-Import Bank, the International Co-operation Administration of the United States and similar institutions in other countries. They will all have a part in bringing back to life a region whose reconstruction will require much more than $500,000,000.

Determined to accomplish this in the shortest possible time, the Chilean Government has cut all nonessentials, including the $100,000 budgeted for the celebration of the 150th anniversary of Chile's independence.

The Inter-American Development Bank will have much to do with the carrying out of all the various plans evolved for the purpose of accelerating Latin American industrial development and public works. The bank opened for business on October 1 in Washington, under the direction of the Chilean economist Felipe Herrera. It will also be concerned with projects calculated to have an immediate effect on the individual welfare of Latin American citizens—better housing, water supply, land distribution, sanitation and so on. The IADB has an authorized capital of $1,000,000,000, minus the amount Cuba would have contributed if its present Government had participated.

Two presidents—Arturo Frondizi of Argentina and Manuel Prado Urgarteche of Peru—traveled to Europe to interest European capital in their respective countries. Both returned with substantial com-



Advanced architectural design stamps Brazil's new capital, Brasilia. Here the Three Powers Plaza pool mirrors the bowl-shaped Chamber of Deputies.

mitments that will bolster their economies. Dr. Pedro Beltran, the prime minister and also the successful finance minister of Peru, visited the United States on a similar mission and to receive an honorary doctorate of laws from Yale University.

The coalition governments of Presidents Alberto Lleras of Colombia and Romulo Betancourt of Venezuela had the problem of dissidents who have formed wings within the commanding parties—Liberal in Colombia and Accion Democratica in Venezuela—but both dealt firmly with the situation. President Betancourt signed into law the Agrarian Reform Act of 1959. Land and credits for 700,000 farmers, aqueducts, electrification, hospitals, marketing aids, agricultural research centers, roads and schools are contemplated, and $711,000,000 will be spent to implement this law during the next four years. It was this type of integrated planning that Latin American economists were advocating in 1960 as a preventive for communism.

There was much traveling back and forth within the Americas. President Eisenhower was warmly received in Brazil, Argentina, Uruguay and Chile. In Chile, representatives of the Federation of Students asked him in writing a number of questions on continental problems. These were formally answered after President Eisenhower's return to Washington, and an invitation was extended to seven student leaders to visit the United States as guests of the Government.

The Peking Opera performed in several South American capitals, as did the Howard University Choir, whose huge success can be measured by the fact that in Buenos Aires nine encores were demanded.

"Man with a broom" living in Brasilia: Janio Quadros, elected president of Brazil in October 1960.

ALL PHOTOS WIDE WORLD

NEWS FROM ABROAD

APARTHEID

By ANDREW MARTIN KAMARCK

Lecturer in African Affairs

SCHOOL OF ADVANCED INTERNATIONAL STUDIES, JOHNS HOPKINS UNIVERSITY

Slum areas, such as the one above, are gradually being replaced in the Johannesburg area. Outside the city the government is building new housing developments, below, for the African population.

IN 1960 the Union of South Africa celebrated its Golden Jubilee, the fiftieth birthday of its formation. In the same year the Union Government under Prime Minister Verwoerd intensified its program of apartheid, or "apart-ness," designed to separate from each other as fully as possible the various races living within the Union.

The Union of South Africa faces the most difficult racial problem in the world. The population of 15,000,000 is divided into four main racial groups: the Europeans, or whites; the Africans, or Bantu; the Coloreds and the Asians. The Europeans from the south and the Africans from the north entered South Africa about the time when colonization began in the United States in the seventeenth century.

The 3,000,000 Europeans comprise about one fifth of the whole population and completely control the Government. They are divided into two main groups: the English-speaking, who number more than 1,000,000, and the Afrikaners, or

Boers, who are descended mostly from the original Dutch settlers and speak Afrikaans, a language related to Dutch. Only Europeans are allowed to serve in the Parliament.

The Africans, or Bantu, comprise two thirds of the population, number 10,000,000 in all and are made up of various tribes speaking different languages. About one third of them live on the African reserves which are much like the Indian reservations in the United States. Another third live and work on the European farms. Both of these groups mainly speak their tribal languages and are governed by chiefs. The remaining third of the Africans live and work in the cities and towns of the Union. These are the most advanced of the Africans and many of them are educated as well as the best educated people in the world. They are the ones who are most affected by apartheid.

The Coloreds are in much the same position as are the Negroes in the United States and make up about 10 per cent of the total population, or about 1,500,000. Practically all of them live in the south near Cape Town. They are a mixture of races, mostly of Europeans, Negroes from the west coast of Africa, Malays and Hottentots—the original inhabitants of the southern tip of Africa. The Coloreds live, speak and act in much the same ways as do the white South Africans. When the Union of South Africa was formed in 1910, the Coloreds had the same political rights as the whites in the province where they lived. Over the years, however, these rights have narrowed. The first big step in the apartheid program, which the present Government began when it came to power in 1948, was to take away the right of the Coloreds to vote with the whites for members of Parliament.

The last important racial group in the Union is the Asian people, mostly of Indian origin, who number about 500,000. The South African Government tries to induce them to move to India; a few have gone but the others prefer to remain in the country in which they were born. As a part of apartheid special areas are being set aside in which they will have to live. Even prior to the apartheid program, Asians were not allowed to move into some parts of the Union.

Segregation of the races has been practiced since the founding of the Union, but "apartheid" is a new word only about fifteen years old. It came into use in the platform of the National Party, which has governed the Union since 1948, and it means different things to different people. In theory, it means the separate social, economic and political development of the black or colored South Africans, apart from the white South Africans. At a minimum, it means segregation of the races and the refusal to allow Africans in the cities to become a permanent part of city populations.

Sometimes apartheid is merely another way of saying that the white man is on top in the Union of South Africa and intends to stay on top, come what may. Some of the advocates of apartheid, on the other hand, are liberal or deeply religious people who fully accept the equality of human beings of all races. These men believe that the white man cannot continue to deny equal rights to the other races living in the same area with them. Their solution is to separate the races into different areas, accepting the lowering of their own standard of living that would come from splitting the existing

A policeman and an interpreter examine the passes that Africans are required to carry at all times in cities, under pain of fine or imprisonment.

PHOTOS UPI

economy in this way. They also press the Government to do more to aid in the development of the existing African reserves. Apartheid could thus result in partition of the country between the different races.

The main white opposition party, the United Party, is opposed to apartheid but it favors a large measure of segregation. There are also many whites who are in favor of an integrated society and would grant equal rights to all men within the Union. The nonwhite races are still largely unorganized politically and their attempts at organization encounter many legal obstacles. Some of their leaders have been on trial for over four years on charges of treason. It is not impossible, however, in spite of all this, to find some Africans who would support apartheid.

Since 1948 the South African Government has taken a number of measures in its apartheid program. Some of these have already been mentioned, but there are many others. Members of the different races now go into railway stations by different entrances. Everyone is being issued an identification card showing what his race is. One result of this is that some families have been broken up where a husband may have been classified as colored and his wife as white. The two universities that used to be integrated are now for whites only, while new colleges are being established for the other races. White trade unions are no longer allowed to have members of other races and some jobs have been reserved for white men only. The Government has carried out an enormous housing program for Africans in urban areas, which is unmatched anywhere else in Africa. It has also undertaken a program to encourage industry to develop near the African reserves. It is going ahead with a program of buying land from white farmers to enlarge the African reserves somewhat, and it has called on employers to raise the level of African wages.

Although the Africans and the other nonwhite races have from time to time engaged in some protests against apartheid, the biggest explosion to date has come from their protest against the pass laws that have existed since before the formation of the Union of South Africa. Under these laws it is a crime punishable by fine or imprisonment for an African in a city not to be able to produce on demand by a policeman an official pass authorizing him to be where he is. These laws prevent the Africans in the cities from having the right to live permanently in the only homes they have. If an African loses his job and does not find another one within a short period, he may be uprooted and forced to leave. Many families are broken up and the urban African is denied a sense of permanence and security of life in the city.

In the course of a demonstration against the pass laws at Sharpeville, an African township near Johannesburg, on March 21, 1960, about 70 Africans were killed by the police. Following on this and other violence, the United Nations Security Council was asked by 28 Afro-Asian countries to consider the situation. The Council adopted a resolution calling on the South African Government to abandon its policies of apartheid and racial discrimination. The resolution was adopted by 9 votes to zero, with both the United States and Russia voting in favor and the United Kingdom and France abstaining.

In London, in May, 1960, at a meeting of the countries belonging to the British Commonwealth, the prime ministers expressed to the South African representative their views on the racial situation in his country. Two members of the Commonwealth, Malaya and Ghana, have undertaken a boycott of South African goods.

Apartheid, although an internal program of the Union of South Africa, has become an important international interest and will undoubtedly become even more so. The contrast in Africa is too striking to be overlooked: in 1960, elsewhere in Africa, some 17 countries became independent; in South Africa, because of apartheid, Africans lost their last remaining vestige of representation in Parliament.

HOW GOOD Is Soviet Education?

By ELLSWORTH RAYMOND

Associate Professor

New York University

Soviet schools emphasize language study; these fourth-graders read a German book in the school library.

THOUGH West Europe and Japan have long had high educational standards, the United States for decades has been the world leader in mass education. But today American supremacy is seriously challenged. The success of the first Soviet sputnik revealed that giant Russia had developed mass-educational techniques rivaling those of the United States. What are these techniques, and just how were they developed? Will Russia eventually surpass the United States in mass education and thereby create a superior civilization? For proper answers we must carefully examine the history, achievements and failures of Soviet education to date.

When the Communists took power in 1917, Russia was a country where less than one-third of the people could read and write. For the next three years a civil war between Red and White Russians threw the country into chaos. Many schools closed and education stagnated.

After the civil war ended in Communist victory, Lenin and Stalin began a strong campaign against illiteracy. Attempts were made to force every child to attend early grade school. Children were told to go home after school and teach their parents the day's lesson. Communist youth brigades opened literacy schools for adults in city slums and rural villages. Every large industrial enterprise opened a night school to give its employees at least the rudiments of education. Premier Khrushchev himself received his early education in a school at a Ukrainian coal mine.

The literacy campaign produced impressive results. By the late 1920's, half of the Soviet population could read and write. But while literacy increased, formal schooling declined. Soviet schoolhouses became laboratories for fantastic educational experiments. Examinations and marks were abolished. School teachers had little authority, and students usually managed their own schools. Instead of having regular courses, students formed brigades working on projects which included several subjects. At spring sowing time, for instance, a brigade might study a "complex" of agriculture, soil analysis, weather, botany and farm mechanization. Students learned a little of everything and not much of anything.

In 1928 the Five-Year Plans of fast, forced industrialization began in the U.S.S.R. Tens of thousands of engineers and millions of skilled workers were required to staff fast-growing industry, but the progressive schools could not train them. Thus in the early 1930's the Soviet school system had to be drastically overhauled.

Student control of the schools was abolished. Instead, teachers were given almost dictatorial powers. When a teacher entered the classroom all students had to stand at attention. Courses were taught as thoroughly and severely as in the upper-class schools of czarist days; student brigades and study complexes vanished.

To solve the shortage of skilled workers, many years of mathematics and laboratory science were included in the programs of grade and high schools. Students in both had to study interminable technical courses whether they liked them or not. The best students entered college, where again there were almost no elective subjects. A Soviet youth could choose his college but, once he was enrolled, he studied precisely what the state wanted him to learn. The entire school system became highly technical, not as an evil plan for world leadership, but simply to fill the shortage of industrial personnel.

After World War II, Soviet school programs became even more technical. Courses in art, literature and social studies were reduced to allow time for more science and mathematics. Undergraduate college programs were lengthened to five or six years, so the average Soviet college graduate would have more training than the average American bachelor of arts or science.

U.S.S.R. college programs in science and engineering today are difficult and extremely high-level. The five-year program for a high-school teacher of physics now includes three and a half years of higher mathematics, five years of theoretical physics, five years of applied physics and four and a half years in methods of teaching physics. A research physicist must take a more thorough program of studies.

When a Soviet youth enters college to major in science, he is already better trained than most Americans. He has completed algebra, geometry and trigonometry in high school. He has studied physics since the sixth grade and chemistry since the seventh. On the average an American science major in college takes courses in his junior year which a Soviet student studies as a freshman. The Soviet youth, therefore, completes his five-year college program with a knowledge equal to that of an American graduate student.

Foreign languages are another field in which the U.S.S.R. school system excels. A foreign language is usually studied from the fifth grade up. About 45 per cent of the grade- and high-school students study English; 35 per cent, German and 20 per cent, French. A few grade schools even teach Arabic, Chinese, Hindi and other oriental languages.

Today fewer than 10,000 students in American high schools and colleges are learning the Russian language. In contrast 5,000,000 U.S.S.R. students are learning English. This does not mean that the U.S.S.R. has 5,000,000 English-speaking people. Few Soviet citizens travel abroad, so there is little opportunity to practice conversation. But millions of Russians can read American technical publications and profit from new scientific achievements. Very few American scientists can read Russian. Thousands of volumes of Soviet scientific books lie unused and unread on American library shelves.

A Soviet student studying to become a high-school teacher of English has a thorough college program. The U.S.S.R. has 14 colleges solely devoted to training translators and teachers of foreign languages. The 5-year program of an English major includes a year of Latin, 3½ years of English phonetics, 4 years of

PHOTOS, SOVFOTO

Future Soviet teachers, in the Potemkin Pedagogical Institute in Moscow, are learning the fundamentals of analytical geometry with the help of models.

English grammar, 4½ years of English conversation, 4½ years of writing English, 1½ years of English literature and 3½ years of German or French. In the United States this would constitute a program for college teachers of foreign language. Yet most Soviet language students become teachers in grade or high schools. The most outstanding graduates of language colleges become translators for the foreign ministry, army or police. Others are used as guides for foreign tourists traveling in the U.S.S.R.

The United States must improve its methods greatly to match the thorough science and foreign-language instruction of the U.S.S.R. But this does not mean that Americans should imitate the entire Soviet school program, which by democratic standards has many faults.

The U.S.S.R. official emphasis on mathematics and science has resulted in a very unbalanced educational system. The average Soviet student is insufficiently trained in philosophy, sociology, civics and economics. The little he is taught is restricted to a narrow Marxist viewpoint. By American or West European standards he is very ignorant of world affairs.

The American educational system has certain other advantages which are often overlooked because of Western respect for Soviet scientific training. The United States today has about 3,500,000 college students compared to 2,100,000 in the U.S.S.R. Though the Soviet Union has more teachers for grade and high school, the United States has more college professors. At present the American population contains more than twice as many living college graduates as does the population of the U.S.S.R.

Though the Soviet population in 1960 is 30,000,000 greater than that of the United States, there are more American students in grade and high schools. Almost all American children complete grade school, and over half finish high school. In contrast, according to Premier Khrushchev, one of every five Soviet children never completes grade school. Only one of every three graduates from high school. The average American adult has about 11 years of education. According to the 1959 Soviet census, 55 per cent of the adult population of the U.S.S.R. has not completed seven years of grade school. The average level of education in the U.S.S.R. is probably about six or seven years.

The only school in many Soviet farm villages is a four-year grade school. To attend upper grades the student would have to commute to a larger village or nearby town. As a result many farm children quit school after the fourth grade. Even if a village has a complete grade school, there usually is no rural high school. To attend high school the student must commute to a nearby town or city. Thus many other youths stop their education at the end of grade school.

Part of this mass withdrawal is simply because the grade- and high-school programs are so difficult, with no easier alternative courses for slow students. Not every Soviet child is capable of completing grade- and high-school training, which includes seven years of science and six years of foreign language. There are a few special schools for backward children, but only in large cities.

Yet the main reason why so many Russians do not attend high school or college is the low standard of living. The average rural wage in the U.S.S.R. is still only the equivalent of $30 per month, and the average urban wage about $60 monthly. When a rural child reaches the age of twelve (sixth-grade age), he or she is required by law to work on the collective farm where he resides. A city youth can legally commence work at 14 (eighth-grade age), and many do because their families need the additional income. Once a child is working full time, he has little leisure for education.

Thus the Kremlin does not truly strive for mass education above the grade-school level. Soviet higher schools are selective and strive for quality in certain technical fields rather than for quantity. In contrast the American aim is for most students to complete high school and receive a broad general education. Moreover, American educators are trying to encourage good high-school students to enter college, even if this means doubling present college enrollment. In numbers of people being educated the U.S.S.R. lags behind the United States, especially at the high-school and college levels.

Why, then, does the Soviet Union have more engineers and scientists than the United States? The explanation is simple. Most American colleges teach liberal arts, and only one fifth of United States college students major in science or engineering. There are almost no liberal-arts colleges in the U.S.S.R. Instead, each Soviet college trains its students for a specific profession. More than half of all Soviet college students major in science or engineering. Even the teacher-training colleges concentrate heavily on science. Today their school system employs 300,000 science teachers, compared with 160,000 in the United States.

Soviet colleges graduate so many engineers that the U.S.S.R. now has a surplus. Many young engineers work in the factories as foremen because no engineering positions are open. According to the statements of Soviet educational officials, about half of all Russian engineers today are not employed in their profession, but hold administrative jobs in industry or government. Yet the Soviet Government is making no effort to decrease the number of college students majoring in engineering. Evidently the Kremlin considers our era a machine age in which excess engineers can always be useful.

In contrast the majority of American college graduates majors in liberal arts, education or business administration. This alone indicates how difficult it is to compare the two systems. American schools try to teach children and youths to think independently and to develop talents for useful careers in professions chosen by the students themselves. In general Americans strive for a broad education which, educators feel, best equips young people to face the complexities of modern life.

The Soviet educational system is narrow, concentrating mainly on skills needed to make the U.S.S.R. a leading industrial power.

Variations on the Communist Theme

Carlsbad, Czechoslovak health resort, is no longer the meeting place of high society. Earnest workers in search of health now stroll along the promenades as they sip the famous mineral waters of the spa.

By HELEN HYNSON MERRICK

AS the oldest and most advanced of the communist states and the one that holds most of the others in thrall, the Soviet Union has set the pattern of communist society in this century. It is this pattern on which the changes have been rung.

All the communist states claim that they are followers of Karl Marx, marching toward the classless social order that he envisioned. Yet his ideas were to a degree the product of his reaction to the pitiable conditions of the factory workers during the initial period of the industrial revolution. He did not foresee the vast changes that were to come about in the following century. Moreover, Marx was a city man and focused on the city—the factory—worker. He paid relatively little attention to the farm worker.

The first successful communist revolution nevertheless occurred in a largely agricultural country, Russia. So, from the very beginning, Nikolai Lenin and other Soviet leaders had to improvise on Marxist theory. Instead of a *bourgeoisie* —a property-owning middle class living in cities and towns—the Russian Communists had to deal with the kulaks, landowning peasants. They were liquidated ruthlessly, to make way for state-owned and -controlled collective farms. Under Stalin at least, the collectives were never efficient, and agriculture was long one of the weakest sectors in the Soviet economy. Nevertheless, farm collectivization became one of the cardinal tenets of communism.

Let us look at some other features of the Soviet pattern. The Government plans and controls all economic activity, fixes practically all prices, wages and taxes and thus regulates living standards. At the same time, profits and taxes provide the Government with a huge income and it alone can invest capital. Though more consumer goods are being produced since 1953, the emphasis is still on heavy industry. The Soviets lay great stress on education and scientific development. Higher education, however, is hedged by various requirements. Before a prospective student can attend a university or institute, he must often work on a farm or in a factory. Creative artists have relatively more freedom today but the state still exerts strong influence for the simple reason that it is the buyer.

Social controls run parallel with the economic ones. The individual cannot own land, a business or any other property that might produce a profit; he cannot form an organization of any kind without government regulation; he may not travel outside the country without permission and, though he votes, he has no real choice of candidates. There is no freedom of the press and only token freedom of worship.

Far from being the classless society of which Marx dreamed, the Soviet Union has a definite hierarchy. The peasants form the broad base. Above them stand the factory workers. Next in importance is the "white-collar proletariat": teachers, doctors, minor officials and the like. The top group consists of the economic and political managers, police and army officers and outstanding scientists, technical experts and artists. At the core are the Communist Party leaders, including the small handful who wield final authority. For, as communism has worked out in practice, it results in dictatorship; although in the interests of efficiency there is a trend toward economic decentralization.

Under Stalin the U.S.S.R. was openly a police state. The atmosphere is more relaxed today; use of force is nevertheless imbedded in the pattern.

For all communism's disregard of the individual and the Marxist interpretation of history, denying the influence of individuals, it is notable that the Soviet model itself and the communist countries least in its shadow have had forceful leaders. Under Marshall Tito, Yugoslavia has gone its own way since 1948. Under Mao Tse-tung, Red China is a partner of sorts and not a satellite of the U.S.S.R. Under Wladyslaw Gomulka, Poland is thus far at least the freest of the Soviet satellites.

When Tito defied Stalin in 1948, he took a chance on being able to keep Yugoslavia going without Soviet support and, no doubt, with hope of aid from the West. This hope was fulfilled, mainly by the United States. As relations between the Soviet Union and the West have deteriorated, Yugoslavia has stayed on the side lines.

After the break with the U.S.S.R., Yugoslavia turned away from rapid collectivization and heavy-industry development. In 1950 a decentralized economy was introduced with a system of management by workers' councils. This has been the special feature of the Yugoslav economy, though central financial control and inspection were instituted in 1959. Forced collectivization never worked. Instead, farmers are wooed by the demonstration of the increased yields that modern methods of cultivation and new technological discoveries can produce on large holdings. From another view, although Yugoslavia still has secret police, the people seem to be fairly free to criticize the Government. What amazes visitors above all are the many modern conveniences in evidence.

PHOTOS, PETER SCHMID, PIX

Red China is at the other extreme. Communism in China began on a different basis from what it did in the Soviet Union. Agrarian reform was the initial goal in China and the Communists won thousands of the peasants before achieving control. That the Chinese Communists could do so was partly because the peasants were among the most poverty-stricken and neglected people on earth. Thus the Chinese Communist Government already had a generally docile population with which to work. In their determination to industrialize China and make it one of the world's great powers, if not the greatest, the Communists have gone to extremes. Collectivization has been expanded into the commune system. In April 1960 the Government claimed that some 24,000 rural communes had been organized, each averaging a membership of 5,000 families, a work force of 10,000 and an area of 10,000 acres. It was also claimed that 73 per cent of the rural population was eating in commune-run public dining rooms. The system is being extended to cities.

All this strikes at the most cherished Chinese traditions. No matter how poor a Chinese, he always had a close family life to sustain him. By all accounts the people are kept in line by ceaseless exhortation and by being forced to work so hard—ten and twelve hours a day, after which they are required to study—that little energy is left for anything else.

Children in Red China, taught communist doctrine from their earliest years, attend a communal school.

So while the Soviet Union has been moving in the direction of less regimentation, the Chinese Government has been clamping down on the people ever harder. In part this is because they are at such different stages of development. Red China is still in the first throes of industrialization and is far more isolated from the rest of the world. That it is to the mutual advantage of the two leading communist nations to remain friends—probably for years to come—can hardly be doubted. Nevertheless their different circumstances, or so it may be surmised, led them to an open dispute in 1960 on communist ideology. The Chinese leaders appear to believe that war, that is, world revolution, is inevitable; Russian leaders talk of "peaceful coexistence."

Poland's very location, wedged in between East Germany and the U.S.S.R., handicaps it. Yet this open plain nourishes a fiery spirit. The Poles are fervent patriots above all else, perhaps for the very reason that their country has so often been erased from the map. Even the Polish Communists are patriots first. In addition the Soviet Union must reckon with the strength and influence of the Catholic Church in Poland.

When revolt flared in Poland in the fall of 1956 (after Khrushchev's famous denunciation of Stalin), Gomulka was able to halt Soviet intervention and wring concessions from the Soviets with the threat of utter chaos. It is true that the limited liberties won then have been whittled down. But police terror has not returned. 90 per cent of Polish farms are still privately owned and 40 per cent of Poland's trade is with noncommunist countries. Poland receives aid from the United States.

Because of trade and aid, Poland is more open to the West, and Western influence is visible. New works in music, the theater, painting and sculpture are often radically advanced. In private conversation with Western visitors the Poles express their antagonism to the Russians (which goes back centuries) with startling candor. On the other hand, the hopelessness of Poland's position seems to have bred apathy and moral indifference. Polish communist leaders complain that the people neither work hard enough nor obey orders. There is little reward. The Government keeps wages low, and the housing situation in the large cities is so bad that no one has any privacy. Pilfering and black-market deals are rife.

As the whole world knows, Hungary's 1956 revolt was put down brutally. Soviet troops have remained, estimated at 50,000 to 80,000. There are reports that purges and executions have continued. Collectivization (supposedly some 70 per cent of the farmlands) and mechanization have been forced ahead. Consumer goods continue in short supply. A State Office for Church Affairs supervises and controls religious matters, sponsoring organizations that co-operate with the Government. Though the Hungarian Writers Union (one of the centers of the 1956 revolt) has been permitted to re-form it was warned that no literary or artistic work must be "aimed against the legal order of the state." Hungary's economy is also being meshed ever more closely with the Soviet Union.

Much the same economic pattern prevails in Bulgaria, Czechoslovakia and Rumania. All these are also following the Soviet's new educational plan, of requiring university students to do at least part-time work in factories and on farms. Though Communists have used intellectuals they have never trusted them.

Collectivization has been pushed ruthlessly in Bulgaria though the number of collective farms had been reduced by mergers. There has been a revival, however, of truck farming. Bulgaria's most famous agricultural product, attar of roses, still finds its way to world markets. Most of Bulgaria's trade has remained within the communist bloc but it is beginning to increase with Western Europe.

In Rumania, some hard-core resistance to collectivization appears to remain. The claim is made that 75 per cent of the croplands have been thus organized but it appears that only about a third are "pure" collectives; the rest are under peasant associations. Production is unsatisfactory, partly for lack of equipment. The big investment has been in industrial development. In any event there was a drive in 1959 to ban private owners from holding more land than they themselves could work. Another hint of conditions inside Rumania is the Government's continuing outcry against crimes against the state, which include theft and embezzlement. Creative literary and artistic work is still held to the principles of "socialist realism."

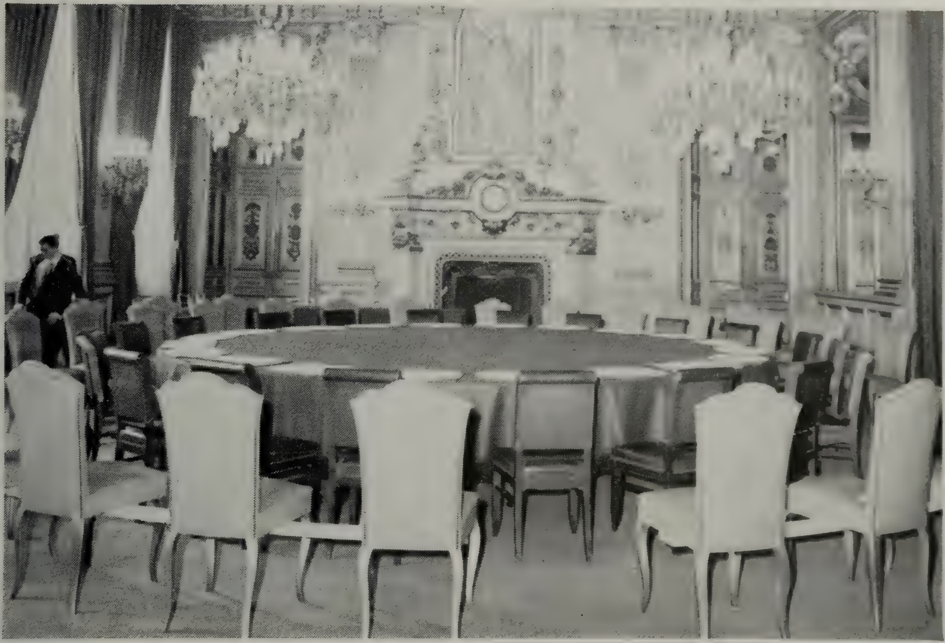
As a country with Western traditions, Czechoslovakia has not shared in the comparative relaxation permitted in some of the other satellites. Indeed, Stalinists appear to be in the saddle there, watchful for any signs of "contemporary revisionism." Always an industrial nation, Czechoslovakia's manufacturing is being speeded up still further. The country's intellectual life has suffered. Artists and writers are under constant pressure to prove their loyalty to communism.

Eastern Germany is still occupied by some 400,000 Soviet troops. Its communist rulers are determined that it catch up with West Germany economically. One of the main difficulties in achieving this goal is a shortage of labor. Between 1949 and 1959 some 2,300,000 people fled to West Germany in spite of all the East German Government's efforts to isolate its citizens. Industrial output has been rising but farm production lags.

Of all the satellites, little Albania seems to be the most loyal to the U.S.S.R. although clinging to Stalinism. Albania, in a sense, has also benefited most. Long ignorant and poverty-stricken, its people are at last getting a measure of education and being introduced to industry.

Outside of Yugoslavia and Red China, how long the variations will persist no one can foresee. Day by day, in economics, communications, power lines and the like, the satellites are being meshed ever more tightly. This could lead eventually to complete conformity.

The New Diplomacy



UPI

An ornate room in the Palais de Chaillot would have been the site of the Paris summit meeting, but . . .

By STEPHEN RUDDY

IN the sixteen years since the end of World War II there have been remarkable changes in the style of world diplomacy. Today diplomacy is once more at the crossroads after the summit fiasco in Paris in the spring of 1960.

Until that time, there had been two definite changes in diplomatic procedure, each of which followed after the death of a political giant. The first change occurred in 1953 after the death of Russian Premier Joseph Stalin; the second after United States Secretary of State John Foster Dulles died in 1959. Each time there was a relaxation of tension as governments of the world paused before seeking new avenues of political communication that would prevent the outbreak of a nuclear war.

Profound scientific, political and economic developments, as well as great advances in transportation and communication, made it inevitable that traditional formal diplomatic practice must give way to new methods more in keeping with the times. A unique combination of these factors and the personalities of the world political leaders involved dictated the direction that change would take.

The "new" diplomacy has been characterized by a great amount of traveling by the heads of government of the Great Powers. It also has resulted in a marked increase in elaborate state visits coupled with many more private, face-to-face consultations by world leaders. One very important side effect of this new diplomacy has been the downgrading of the power and influence of diplomats whose rank is lower than top level.

After the end of World War II and the beginning of what came to be called the cold war between the Soviet Union and the Western alliance, attempts were made to lessen the conflict and evolve solutions for the many points of dispute. However, the results of these early postwar conferences were negligible.

Although many diplomats felt that the method of approach might be contributing to the poor results of these conferences, it was Sir Winston Churchill, Britain's Prime Minister during World War II, who first voiced an appeal for new tactics. Churchill remembered his World War II liaison with President Franklin D. Roosevelt and Premier Stalin, and its value to the war efforts of the United States and the United Kingdom. He thus put forward the idea of a meeting of the heads of government to be held at the "summit," far from the pressure of the press. He saw that diplomats could get nowhere, boxed in as they were by complicated agendas and publicly stated positions that no one dared modify for fear of losing face.

The first chance for using Churchill's idea came with the death of Stalin. The rigid old Soviet despot left behind him a nation expanded in its political and industrial power at the price of a cruelly repressive political system and a primitive consumer economy. The men who followed him responded to the needs of the Russian people by relaxing the domestic repression and expanding production of long-denied consumer products.

With the rise of Nikita Khrushchev to control in the Kremlin, a new flexibility developed in the technique of Soviet foreign policy. The West responded to the new Soviet tactics, and the result was the experimental summit conference at Geneva, Switzerland, in 1955. This meeting was an example of everything Churchill feared, and a model of what he said a summit conference should not be. Held in a bright glare of publicity, the conference found the leaders of the United States, Britain, France and Russia facing one another around a square table. They were backed by hosts of assistants and aides. The result was a public espousal by each leader of previously stated positions and little informal negotiation.

The disaster at Paris brought serious concern as to the wisdom of continuing summit diplomacy. Negotiation by heads of state should theoretically be the shortest road to understanding. However, with world attention focused on the negotiating chiefs of state, the whole situation is likely to explode if unbridgeable differences arise. If there should be such differences in secret diplomacy among ministers, further negotiation might be possible.

During the 1950's, the diplomacy of travel developed. In many ways it reached its ultimate expression in the methods of Secretary of State Dulles. Mr. Dulles coupled his dislike for summit negotiations with a passion for running American foreign policy from his brief case. As a result of President Eisenhower's illnesses and Dulles' own experience and authority, he was able to conduct his activities in a highly personal and peripatetic manner. He did this despite the double criticism that his traveling to and fro made impossible any careful preparation of policy in Washington and that the consequent downgrading of ambassadors and others who normally help formulate policy was bad for State Department morale and efficiency.

Dulles' methods were helped by the Soviet practice of referring diplomatic problems to higher authority on every occasion. No discussion of even minor matters was possible with them in many cases before it was referred up to the level of Foreign Minister. The net result of all this was to increase greatly the movement of top diplomats and also their work load. Even though Geneva had proven a false hope, there continued to be great pressure and argument for another summit meeting. One basic fact pushed both sides toward it. The ever-expanding nuclear-weapons race found the Soviet Union and the West facing each other with armories of weapons sufficient to "overkill" any enemy.

The time when it was possible for one nation or any alliance of nations to win a true victory was gone forever. The leaders of both sides knew nuclear hostilities would cause destruction far out of proportion to any attainable political objective.

Dulles had long opposed another summit on the grounds that the Soviets would use it purely to gain propaganda advantage. However, before his final illness he was cautiously moving United States policy toward such a meeting.

When Dulles died, President Eisenhower became the prime director of United States foreign policy in fact as well as in name. Always inclined to be more optimistic than Dulles, he carried with him into this new role the conciliatory and businesslike approach that had marked all of his conduct in the White House.

Eisenhower began to apply the talents of his unique personality to the problems of diplomacy. In a diplomatic revolution almost without parallel, he shifted the manner and attitude of American policy in a matter of months. He announced that he would see Russia's Premier Nikita Khrushchev in Washington after first consulting with America's allies in Europe. This announcement started a busy round of consultations. Eisenhower visited London, Bonn and Paris; Khrushchev went to Washington, and then Peking. Adenauer traveled to Washington, De Gaulle to London and Washington, Khrushchev to Paris, and Macmillan to Washington.

While these consultive trips were taking place, another type of diplomacy flowered. This was the increased use of the ceremonial tour. Such trips, made by world leaders to other lands, have tended to become complicated exercises in showmanship with parades and fanfare, addresses before legislatures, banquets and other appearances before the greatest number of people possible. Each trip became an attempt to show both the dignity and power of the visitor's nation, and the humanity and personality of the leader himself.

Summit diplomacy is essentially personal diplomacy. Its effectiveness depends upon the personalities, abilities and intentions of the negotiating heads of state. The style of future diplomacy will be determined by long-range assessment of the best way to insure world peace. Face-to-face meetings at the summit may continue on different terms than in the past; there may be a return to the more traditional manner of diplomacy or perhaps some new compromise method may be devised as most appropriate for the times.

Prime Minister Churchill, President Roosevelt and Premier Stalin meet in Yalta. Churchill, after World War II, remembered the efficiency of such face-to-face encounters and called for a "summit" meeting.

WIDE WORLD

The THIRD FORCE in the United Nations

By MAURICE GHNASSIA

UN Press Correspondent

THE year 1960 brought a significant change to the United Nations. Until last year the industrialized countries of the Atlantic Alliance and the Soviet–East Europe bloc had been dominant. The pattern of voting had reflected East-West tensions, with small countries aligned on each side. Debates often ended in stalemate. By the beginning of 1960, however, the explosion of African nationalism into a growing number of independent states pointed toward a change of approach to world problems in the United Nations. A new pattern of voting was emerging as more underdeveloped nations became members. The end of the "automatic majority" of the big powers was in sight. Then, when the Security Council met in May a "third force" was born, made up of the underdeveloped countries of Africa, Asia and Latin America.

When the United Nations was formed in 1945, there were only four African countries—Egypt, Ethiopia, Liberia and the Union of South Africa—among the 51 charter-member nations. By the start of 1960, total UN membership had grown to 82 nations, of which 10 were African states. The United Nations forecasts total independence for Africa by 1965. This would boost UN membership to more than 100 countries, of which approximately 40 would be African. Since, in the General Assembly, each nation has one vote regardless of its size, the increased African representation would mean that the underdeveloped countries, voting together, could greatly outnumber those of the industrialized world. In other words, voting power is steadily moving "from the rich to the poor" as new member states are admitted. The accent is shifting from East-West to North-South for most of the underdeveloped countries lie in the Southern Hemisphere.

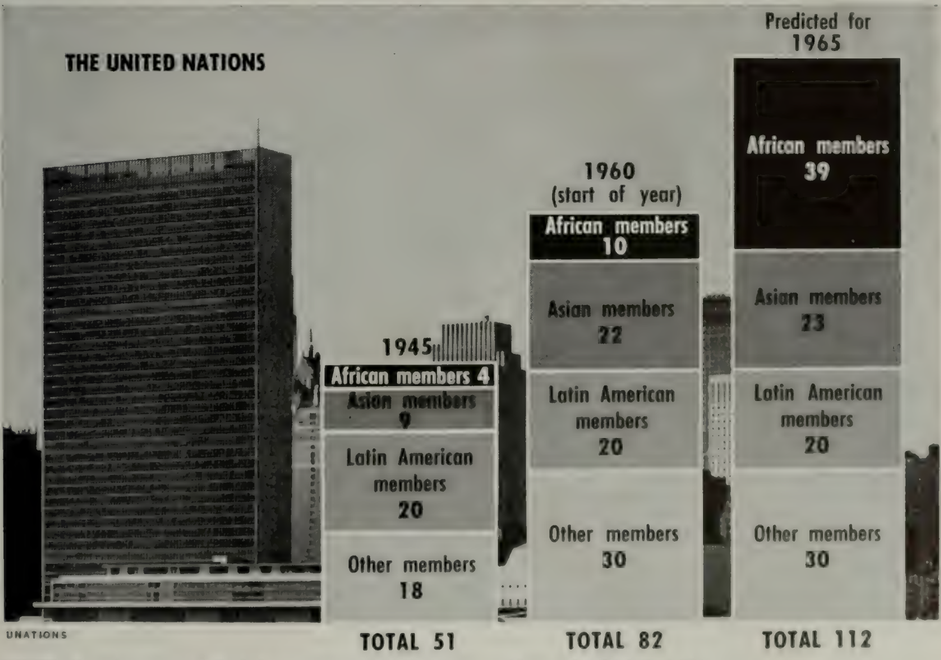
The action of the African-Asian-Latin American group in May indicated one direction this new third force may take in the future. At the request of the U.S.S.R. the Security Council met to consider a Soviet complaint against the flight of an American U-2 reconnaissance plane over Russian territory on May 1. Argentina, Tunisia, Ecuador and Ceylon, among the current members of the Council, used their influence to avoid a vote on that complaint. At the same time they introduced a resolution urging the major powers to seek agreement on disarmament and related issues. The resolution spelled out clearly to the United States and the U.S.S.R.: "Find an area of agreement. We will help you, but first stop quarreling, because we have more important problems to take care of." It was virtually with that resolution, approved by a vote of 9 to 0 (the Soviet Union and Poland abstained from voting), that the third international force of the "poor" countries was born. The Latin American and African-Asian groups had acted together in the past in small economic debates, but never before in a matter of such political importance.

Now that they have emerged as a definite third force, the underdeveloped countries are expected to be influential in working out objective and fair solutions to other East-West disputes. Observers hope that cold-war debates can be replaced by constructive consideration of disarmament and the problems of the underdeveloped continents. Some UN Secretariat spokesmen expect one of the principal efforts of the third force to be increased concentration on disarmament, possibly in the Disarmament Commission which is made up of all UN members. This would seem logical because the poor countries are trying hard to save their already small national budgets for essential expenses and for such national emergencies as floods, earthquakes, epidemics, fires and so on. It is impossible for them to spend a large percentage of their funds on armament.

Poor countries have learned, both from history and from recent tragic experiences, that the most valuable thing they can lose is their freedom. They have no interest in fighting one another. On the contrary, they have a great deal to fear unless they unite. The word "defense" as an expression of military preparedness is fading from the diplomatic vocabulary of the underdeveloped countries. Instead they speak in terms of co-operation, industrial development, research, automation and universities. The new African states, the Latin American countries and the Asian group are not interested in the cold-war issues or in ideological differences. Washington and Moscow know this. The African countries in particular want to concentrate on economic development as a means of preserving their newly acquired independence.

When the disarmament question finally moves toward solution there should be a substantial reduction in expenditure for both nuclear weapons and the means of making use of them. This would release additional funds for assistance to the underdeveloped countries. Despite emphasis on the cold war during the 1950's, the United Nations gave ever increasing help, without political strings or discrimination, through such agencies as its Food and Agriculture Organization (FAO), World Health Organization (WHO), Educational, Scientific and Cultural Organization (UNESCO) and International Labor Organization (ILO). In the 1960's it should be able to give more aid than ever before to Southern Hemisphere member nations through these technical-assistance programs. And, as UN membership grows, it is expected that additional funds will be invested in the economic development of the new members.

Mainland China is expected, according to some authorities, to become an increasingly important factor in the world picture during the 1960's. Many observers believe that, with the rise of the third force and its ability to command a majority in United Nations debates, the admission of mainland China to the United Nations is inevitable. Some authorities on economic planning even predict that during the current decade China may possibly assume United Nations leadership in the program of assistance to the have-not countries. China is the last vast under-



UNATIONS

NOTE: Certain countries include areas on more than one continent. In this chart the Soviet Union is included in the category "Other members". Turkey is included among "Asian members"; and the United Arab Republic is included among "African members."

developed nation of the world to rise from the depths of poverty. Now it has reached a stage where it has been able to provide both technical help and badly needed medical supplies to some of the new African nations. Many of the underdeveloped countries would welcome China as a United Nations member.

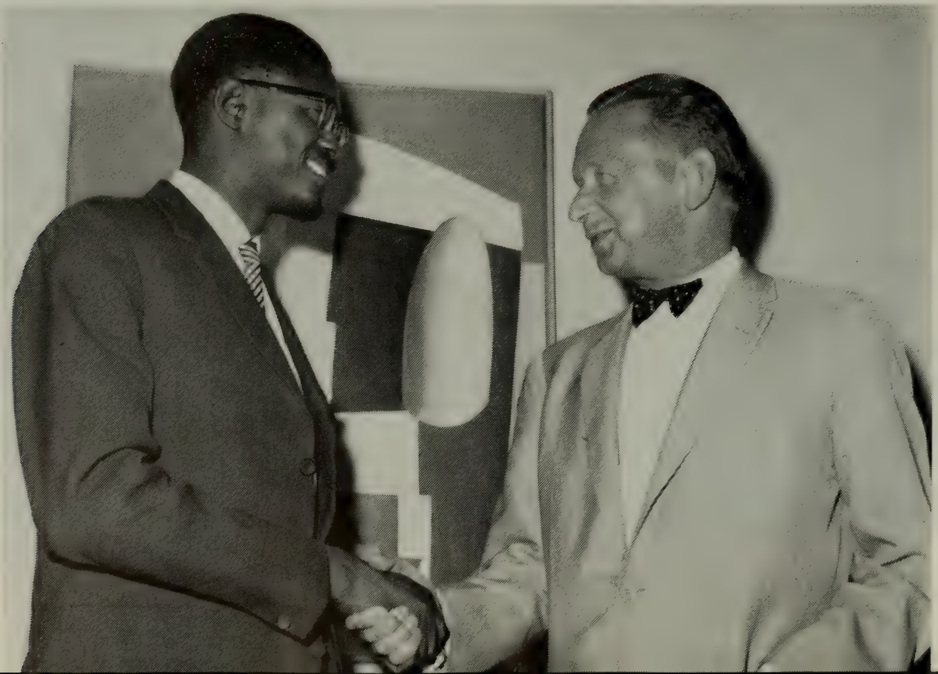
According to some observers, the United Nations will be concerned during the early 1960's with three main issues—East-West relations, colonialism and relations between developed and underdeveloped countries. At the start of the 1960's, East-West tension increased with the U-2-plane incident, the failure of the Paris summit meeting, the cancellation of President Eisenhower's visit to Japan and the summer UN debates on the Congo, Cuba and the Russian accusations concerning the American RB-47-plane flight. There were ten sectors especially in which relations could suddenly grow worse: Berlin, Quemoy and Matsu, Korea, Vietnam, Laos, the Indian-Chinese border, Iraq, Guinea, Algeria and Cuba. Colonialism will probably give way to total independence as an issue, but not before bitter debates have taken place. It is possible that there will be a temporary but dangerous amount of tension between developed and underdeveloped countries. It is also possible that the Soviet Union will become increasingly integrated into the world economy during the first half of the decade. There will probably be a strengthening of economic ties among the third-force nations.

Apart from the political, social and economic problems arising from African independence, the United Nations is faced with an immediate and very practical difficulty. Room must be found in the crowded United Nations building for twenty-five to thirty new delegations with their ambassadors, flags, automobiles, office staffs and press corps.

Wherever its delegations are housed, it is hoped at the United Nations that the third force will help in bringing objectivity and equilibrium to the discussion of the problems of the two leading countries of the world. This is particularly important since possession of the absolute weapon makes East-West problems those of the whole world. Today the United Nations is the only place where the United States and the Soviet Union can meet to discuss, under legal procedures and with the objective help of other member nations, all the problems that separate them and that are creating dangerous international tension.

Patrice Lumumba, first premier of the Republic of the Congo, shakes hands with United Nations Secretary-General Dag Hammarskjold at United Nations headquarters in New York City on July 24, 1960.

WIDE WORLD



INTERNATIONAL AFFAIRS

NEW COMMUNIST TACTICS IN SOUTHEAST ASIA

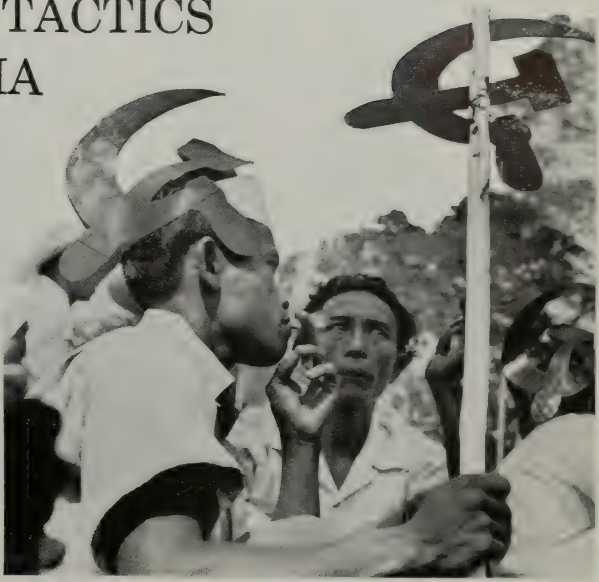
By DOUGLAS HYDE

British Author and Correspondent

THE governments of southeast Asia, which during the late 1940's and early 1950's grappled with communist armed rebellions, today face a new, more subtle communist threat. This threat is not one of bullets but of ideas. It is not in the jungles that the Communists are now digging in but in the schools and universities. They once believed that victory would come to them quickly. Now they know that a lot of slow, painstaking effort is going to be needed if they are to establish themselves as an effective fighting force for communism.

Burma, Thailand, Vietnam, Cambodia, Laos, Malaya, the Philippines and Indonesia all are part of the area known politically as southeast Asia. Each has had its individual experience with communism and, in the process of crushing rebellions, the governments of most of them have outlawed the Communist Party. By 1960 the party's organizations had been disrupted and most of their leaders had either been killed in battle or were in jail after having been captured or forced to surrender.

Only in South Vietnam and the little kingdom of Laos is armed conflict still a factor. In the spring of 1960 the countryside of Laos was plagued once again by uprisings when Prince Souphanouvong, leader of the communist Pathet Lao rebels, and fourteen of his top men escaped from the Vientiane prison. At about the same time, communist guerrillas, getting arms from Red China through North Vietnam, increased terror attacks against troops of the anticommunist government of South Vietnam. But in these countries as well as in the southeast Asian states where there is no fighting, the threat of subversion, particularly in schools and universities, is growing. To understand just why the Communists are working so intently and methodically among the students today, one must understand the story of the earlier rebellions, the fight in the jungles.

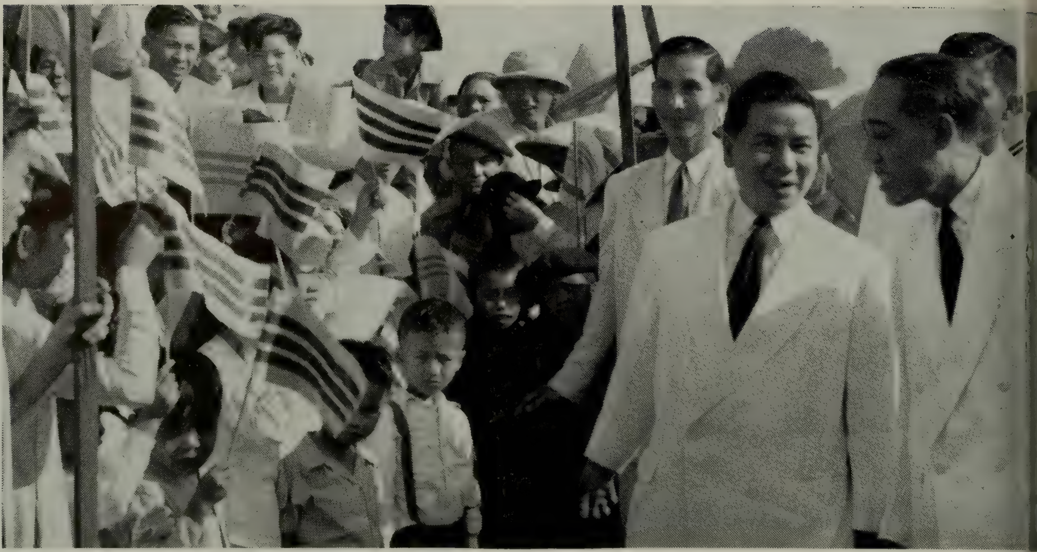


PIX

An Indonesian Communist, with a headdress of the hammer and sickle, displays the Communist emblem.

Back in 1947, leaders of the Communist Party in southeast Asia thought that jungle warfare had ended with the defeat of the Japanese. The Communists in that area were officially committed to the use of parliamentary methods for the achievement of their aims. Yet, in December of 1947, a Yugoslav editor said to a young Burmese communist student who was visiting at his home in Belgrade, "Next time I see you, you will be in the jungle."

The editor had just learned of the communist decision to switch from parliamentary methods to guerrilla war, which was made not in southeast Asia but in Moscow. The decision was passed on to the Cominform, which at that time had its headquarters in Belgrade. The Yugoslav editor knew Moscow's intention even



President Ngo Dinh Diem of South Vietnam is cheered during a tour of the mountain regions where he received tribal oaths of allegiance.

before the news had reached the leaders of the parties who would have to do the fighting. Three months after the editor's conversation with the student, the jungle warfare began in Burma.

The signal to take up arms was given at a communist youth conference in Calcutta in the early part of 1948. Most of the groups which were to take the irrevocable step of plunging their countries into civil war were politically and organizationally raw and immature, although they had acquired some experience of guerrilla warfare during the Japanese occupation. The rawest and newest of them all was the Burmese party, formed in 1937. Possibly because of this it was the most enthusiastic in its response to the Cominform's directive. Within a few weeks most of its members were in the jungle; the rest were operating an underground party in the towns. In Burma the communist rebellion touched off another —that of a minority group from east Burma known as Karens—so the country, which had been independent for only a few weeks, had two armed uprisings on its hands. The Communists of the Philippines, Malaya and Indonesia quickly followed the Burmese lead. Before the end of 1948 half the governments of southeast Asia faced problems caused by the outbreak of armed communist rebellions.

The Communists eventually were defeated but it was a costly business. Because of the revolts started in 1948 the political and economic progress of an entire area, already weakened by war but attempting to rebuild, had been slowed down. Newly independent Burma and the Philippines had found themselves involved in costly, frustrating civil wars. Malaya and Indonesia had still been struggling for freedom from colonialism when the trouble started. They saw their effort dissipated and bedeviled by a bitter and unrewarding fight against communism. Nationalists in Indochina had to fight both the Communists and the French. The North Vietnamese saw the dream of a free and independent country, for which they had fought, change into the reality of a communist puppet state. Backward Laos, years after independence had been gained, was still rent by armed struggle.

The Indonesian Communist Party was the most mature of the communist groups. It took to the gun last and with fewest signs of enthusiasm. Its half-hearted rebellion was on a small scale and consequently was quickly put down. This group lost few of its leaders, kept its organization intact and, with 1,500,000 members, it is today Asia's largest Communist Party.

Malaya's civil war began with the cold-blooded murder of a number of rubber planters in 1948. A state of emergency was declared promptly and lasted for 12 years and 45 days before it was officially brought to an end on July 31, 1960. During that period 149 pages of special emergency regulations were in force. When the emergency came to an end new powers, specially written into the constitution, came into force. These included the right of the government to detain without trial anyone suspected of engaging in communist subversion or planning to do so. By the time the emergency was declared over, more than 11,000 people had been killed. They included nearly 2,500 civilians. The security forces' losses were 1,865 killed and 2,560 wounded. The Communists' losses were 6,698 killed, 2,696 surrendered, 2,819 wounded and 1,286 captured. The Communists had refused to give up the fight even when the Federation of Malaya was given its independence in 1958, thus making nonsense of their claim to be fighting "imperialism." By 1960, however, there were little more than five hundred guerrillas still holding out in the jungles of Malaya.

A similar situation prevailed in the Philippines where by 1960 only four hundred Huks were still left on the run in the Sierra Madre mountains of central Luzon. In that country as in Malaya they were so demoralized that more of the rebels were being killed by their own comrades, because they were suspected of wishing to surrender, than were killed by the government security forces. Disillusioned communist and Karen fighters also were coming down in a steady stream from the jungles of Burma, where no more than a few hundred remained as members of organized units. In March 1960 the writer met in Rangoon, Burma, a group of guerrilla fighters who had only recently come out of the jungle. Bitterly, one of them reminded me that it was to him that the Yugoslav editor had leaked the news of the coming insurrection.

PHOTOS. WIDE WORLD

This Laotian boy fled from rebels with his wounded father's gun, to keep it out of communist hands.

These small groups of communist guerrillas were but the defeated remnants of armies which a few years earlier had numbered up to twenty thousand fighting men. They then had thousands of reserves waiting to fill their places and tens of thousands of supporters maintaining them with food and medical supplies. Today they are of little significance to the governments concerned and they are of practically no significance at all to world communism. History has passed them by. It has been a disillusioning experience for many of them. Russia comes out of the episode very badly in their eyes. So does China, from which they had expected military help which never came.

The years of killing and destruction brought no real gains to anyone. The Communists, the Nationalists and the free world were all losers. Only in tiny North Vietnam did the Communists gain anything at all. Inevitably the armed rebellions led to the various governments' declaring the Communist Party illegal. Above-ground communist organizations were blotted out overnight. Many of their leaders were arrested and are still in jail. I have met most of them there in recent years. In the Philippines a majority of the party's secretariat and political bureau are in prison. Many of the surviving leaders of the Malayan Communist Party, too, are in prison. Chin Peng, the general secretary, in his time one of Asia's most competent communist leaders, took to the dense jungle on the Malayan-Thai border with a big price on his head.

The military and organizational defeat of the Communists in these important Asian countries has been almost complete. Yet, precisely because of this, the threat of subversion is growing. All over southeast Asia the Communists are busy trying to rebuild the party from the ground up. To do this they need above all else new, young leaders.

For the successful prosecution of the present battle of ideas, a far higher proportion of educated leaders is required than was needed for the fight in the jungle. It is this that has made the student population communism's number-one target throughout this entire area. There is evidence that the Communists are working in terms of a ten- to fifteen-year program. During this period they hope to recruit and train a new generation of leaders and then to acquire a new following in the labor movement, in industry and from the professional classes. In pursuit of this end they work slowly and cautiously with a clear sense that time is on their side. In any case the conditions under which they must operate (because the Communist Party is outlawed) make the job of establishing first contacts difficult and hazardous.

For several years now they have been feeling their way toward the best tactics to pursue. Their first big drive among the students of the area began in Singapore in 1956. There they built up and manipulated for their own purposes a Chinese Middle School Students' Union which, while it lasted, had a spectacularly quick success. Within a matter of months they had thousands of youngsters under their control. Dizzy with success, they precipitated the students into a "stay-in" strike. It was supported by thousands of Chinese boys and girls who stayed in their schools night and day for as long as ten days. Then came the inevitable defeat, the arrest of the ringleaders (who included some seasoned Communists) and the breakup of the organization.

Elsewhere, learning from the Singapore experience, the Communists have proceeded more slowly and with greater caution. In the schools and universities of the Federation of Malaya and of Burma they are busy forming discussion groups and study circles and are infiltrating existing student bodies. Similar tactics are being used in South Vietnam and in Thailand, which had no communist rebellion but has outlawed communism because it is conscious of being vulnerable to attack from Red China.

Indicative of the caution now being shown by the party in southeast Asia is the case of the fourteen young Chinese students in the Philippines. So anxious were the Communists to make recruits among the students that they managed to trick these youngsters into joining a group, allegedly to discuss Chinese literature and culture. Eleven of them were girls, the youngest only thirteen years old.

For three years they slowly guided their seemingly harmless discussion and "cultivated" these teen-agers whom they saw as future leaders. Yet so slow and cautious was the process that even after three years they had still not reached the point of even referring to the teachings of Marx or Mao Tse-tung. As soon as the proceedings began to take on a political character the security authorities swooped down. The three leaders were deported to Formosa. The fourteen students were put in jail—victims of the Communists' determination to rebuild their discredited party at all costs.

It is with subversion like this that the new governments of southeast Asia have now to contend. But here at least is one area of the world where the communist menace was met and defeated in its most violent form. The first round definitely ended in 1960 with a victory for the free world. Now a new round is opening. This time the enemy is going to use more subtle methods.

INTERNATIONAL AFFAIRS

MR. KHRUSHCHEV'S ECONOMIC WAR

By GARRETT UNDERHILL

Author and Military Authority

LATE in 1959 Soviet Premier Khrushchev openly declared "economic war" on the United States. Many in the free world were puzzled. How, they asked, could the Soviets hope to surpass the United States economically? Visitors to Soviet Russia have in recent years seen for themselves how backward the Soviet economy is, especially as to living standards. But, before last year was half over, it began to be more clear why Mr. Khrushchev felt that he had reason to be confident about winning his economic war.

All available statistics showed that the Soviets were indeed far, far behind the United States in the production of consumer goods. In 1959 their production of automobiles and household appliances, such as washing machines and refrigerators, ranged between a mere 2 to 4 per cent of American production. The average Soviet family of four people living in the city had to be squeezed into a dwelling space no larger than a medium-sized bedroom in an American house or apartment. And while a mere tenth of the American labor force produced far more food of almost every sort than Americans could hope to eat, about half the Soviet work force was needed to provide a meager, dull diet especially low in meat.

Furthermore, statistics on production in basic industries, such as coal, iron, steel and electric power, showed that the Soviets still lagged far behind the United States. In addition, there was a great lack of hard-surfaced roads for transport by truck, and the railroads were largely devoted to the hauling of freight—and inadequate even for that. At the beginning of last year, the Soviet annual gross national product was estimated to be only about 45 per cent that of the United States.

Americans were, nevertheless, cautioned against complacency by Undersecretary of State C. Douglas Dillon. He repeatedly warned that the Soviets were expanding their industrial production rate each year by 8 per cent, whereas the United States has been expanding at only half that rate. Mr. Dillon was also at pains to point out that there is little comfort for the free world in the fact that the Soviet gross national product last year was less than half that of the United States. During the long years of the post-World War II arms race, which lasted roughly from 1947 through 1957, the official United States view was that the Soviets had merely been able to match American military capacity. In the opinion of a large number of unofficial authorities, however, the Soviets surpassed the United States in this respect. They have shown that they can get at least the same results as the Americans in the military field and from an inferior economic base. Mr. Dillon warned that the West must assume that the Soviets are capable of achieving equal progress in the economic field.

That the Soviets have such inherent capability has been heavily emphasized also by those American specialists whose primary concern is the acceleration of economic progress by advancements in science and technology. The people of the United States and the rest of the free world have a tendency to think that the Soviets must catch up in each particular field in exact terms of the specific types of technology now employed to achieve American production and high economic levels. To think of the Soviet production problem in this way, especially in view of the constantly accelerating rate of scientific-technological development, is fallacious and misleading.

In the years 1953–57 American industry came to realize that economic well being is not dependent merely upon the amount produced by current means. To get more production, more sales and more profits, science and technology must be exploited to develop new products and new means of production. As a result, in the 1953–57 period, American industry as a whole increased its spending for research and development (R and D) by 98.7 per cent, virtually doubling these expenditures in five years. Still-to-be-completed National Science Foundation surveys indicate that the post-1957 period will show a similar rise in the R and D spending rate. The opportunities open to the Soviets to catch up quickly are apparent when emphasis is put on such progress instead of upon greater production of already existing products by present means. Whenever a new level of technology is reached, the Soviets may very well be able to start even with American and free-world industry.

In the military field this possibility of starting anew, on a level with a hitherto more advanced rival, is sometimes referred to as the "Dreadnought principle." In 1903 the British Navy was far and away the most powerful in the world, with fifty-four battleships. The German Navy lagged hopelessly far behind, with only twenty battleships. In the *Jane's Fighting Ships* naval annual of that year there appeared an article by an Italian naval architect, Vittorio Cuniberti. Titled *An Ideal Battleship for the British Fleet,* it set forth the concept of a new-type battleship. Britain's Lord Fisher recognized that the concept called for a revolution in military technology and that it would make all previous battleships obsolete. But, while Britain built the first such ship, called the *Dreadnought,* the new concept proved to be more suited to German seapower aspirations than to those of Britain. All previous battleships now being rendered obsolete, the British and the Germans suddenly found themselves starting even in a new naval race, although Germany had in the past twenty-five years never been able even to approach British sea supremacy.

What can happen in the economic field when the "Dreadnought principle" is applied? To find the answer to this question one has only to examine Soviet achievements in air transport in the past five years as well as possibilities in this field over the next half decade. After World War II, the kings of the world airways were the American-built propeller-driven air transports. Soviet commercial aviation then ranked a bad sixth. But after a time the "Dreadnought principle" opened a way out for the Soviets. Jet-powered aircraft came along and proved themselves in military aviation. Soviet planners were quick to see that jet power could revolutionize commercial aviation as well. And in 1956 they suddenly introduced their first jet transport, proclaiming that they were out to achieve world supremacy in commercial aviation. For the first time in more than twenty years, American leadership in this field was seriously challenged because the Russians could start even with the jets.

While the success of the Soviet air transport effort in the jet age can be determined only by time, United States Government and commercial-aviation authorities are fearful that the Russians may already have gained a decisive advantage in the era of air transport next to come—the supersonic age. The importance of being first in the supersonic field was emphasized to Congress last year by James R. Durfee, Chairman of the Civil Aeronautics Board. The Soviets were well started last year on the supersonic transport, while American industry is still in the study stage and cannot afford to do more without heavy Government backing; therefore, the Soviets already have a major time advantage.

The Russian position in the space race is an even better example of the way in which technological advances can radically alter relative national economic positions. By now it is well known that the Soviets recognized the possibility of exploiting space literally decades before official recognition was accorded space potentials in the United States. Consequently, it was the Americans who had, in that field, to catch up with the Soviets, and so it may be in any new field that science may open up to mankind.

Significant advances or technological breakthroughs can, of course, at any time greatly strengthen the position of either the West or the Soviet Union. As an example, the Russians are now using aviation to "leapfrog" the railroad and highway era, both for passenger and cargo transportation. The huge Tu-114 transport, the world's largest commercial plane, with uniquely powerful prop-jet engines, is expected to provide even short-haul intercity service at bus-level fares. In 1960 the Soviets opened up more than 2,000 miles of new helicopter airlines. These are not only providing swift airport-to-city substitutes for buses and automobiles but are also being used on routes along rough coast lines, in the mountains and in forested country. By their use in such areas the Soviet Government is freed from the necessity of providing expensive road and ship routes, thus gaining an economic advantage.

The "Dreadnought principle" is, of course, applicable to any field of technology and not merely to major "glamour" projects. As a result the United States has no reason to be complacent about its position even in such fields as those of iron and steel production and automobile manufacture, where it now is the leader. The basic methods of ironmaking and steelmaking are many decades old and the industry could at any time be drastically revolutionized by some important technological advance. As it is, the Soviets have already developed and are using a continuous steel-pouring process that permits quicker and less costly ingotmaking and the alteration of ingot size at will. The United States prides itself on its great automotive industry, but the fact remains that the basic automotive component is an engine that in all important elements is much the same as it was fifty-five years ago. Any radical change in engine design by either country could enormously alter the relative industrial position since any significant simplifying of automotive machinery would markedly affect costs. So also would a change from steel as a basic body material to a substance much cheaper to make and form.

Mr. Khrushchev's success in his economic war depends, it is clear, on how far and how rapidly the Soviets can surpass the United States in scientific-technological progress. A comparison of

PHOTOS, SOVFOTO

Soviet customers examine a bedroom suite in GUM, government department store. Premier Khrushchev has indicated that he favors greater production of consumer goods.

achievements in the military field indicates that there is some reason for the United States to be alarmed rather than complacent. The Soviets have already established a decided advantage in their ability to exploit science and technology effectively and rapidly.

Many in the West, however, believe that the apparent Soviet advantage may not be so great as Mr. Khrushchev may think. After all, the West can learn from Soviet experience and catch up fast, just as the Soviets have caught up in many fields of endeavor in which they lagged behind the West. However, scientists and engineers who have studied the relative Soviet-American positions in research and development are concerned about the American situation in the economic war for several as yet little recognized reasons.

Most of the financing of research and development in the United States has been for military purposes. It is obvious that if the Soviets continue to shift emphasis from the arms race to an economic race, the United States will have to consider a radically new approach to the question of Government support of scientific and engineering progress. Increasingly, new technology is becoming so expensive that private firms cannot undertake the financing alone. In 1959 the major United States aircraft firms pointed out that the supersonic transport would cost over $1,000,000,000, more than a combine of industries could afford without major Government financial aid.

Such aid is just what the Soviets provide in sweeping degree for their economic as well as their military enterprises. They have also followed a rigorous policy of making sure that, whenever possible, end products can serve both military and commercial purposes. Their Mi-4 helicopter, for instance, has a rear door that makes it a better troop transport than the comparable American aircraft. Nevertheless, it is quickly adaptable to agricultural crop dusting, to passenger transport and to forest patrol and fire fighting. In contrast, of recent years the United States Defense Department policy has required of the military that they direct their research and development projects strictly toward purely military objectives. Consequently, while Soviet military progress results automatically in economic or scientific progress as well, the United States attains such progress only accidentally.

Moreover, if the world progresses toward disarmament, the Soviets will have an incalculable advantage from their own research and development policy. For one thing, much of their military equipment and personnel may be quickly

The towering Soviet icebreaker Lenin, here headed seaward, is the first nuclear-powered surface ship.

changed over to serve commercial purposes. For another thing the Soviets may be able to gain great propaganda advantage because they can appear to disarm much more extensively, and even unilaterally, without waiting for the West. They can afford to risk converting much of their military equipment to economic purposes because they know that they can convert it back again very quickly.

It is true that a purely military transport is better for military purposes than one that can serve both military and commercial ends; and an aircraft built for bombing alone is better for that purpose than one built to double as a transport. But no one in the West at present really knows to how great a degree defense efficiency, on one hand, and economic well-being and progress, on the other, would be furthered or hindered by the type of commercial-military dual requirement that the Soviets are committed to. Certainly it would appear that the arms, equipment and personnel of the dual-purpose system might well prove less of a burden to a nation in an era when the danger of war was lessening than would a system that developed both military and economic forces side by side.

According to some advanced thinkers, the heavy exploitation of science and technology by the Soviets does not by any means signify that they have permanently forsaken military action in support of their political objective of communizing the world. If they now favor disarmament, it is probably for two good reasons. For one thing, they know that they can trust the West not to start a major war against them. For another, they at present lack any clear-cut or absolute technological superiority in the military field.

Now, should the Soviets exploit science and technology to the utmost, they will have to make certain that their military effort is so arranged that a maximum proportion contributes as directly as possible to economic growth. Only by doing this can they improve their economy rapidly; they must also adopt the dual-purpose principle wherever they safely can. They can also, of course, use advanced technology to try to damage the economy of the free world; to ruin, if possible, the leading free-world industries. Even partial victories, for example, in the air-transport phase of the economic war would help to undermine the largest American industry and the one that has carried on the greatest amount of research and development. Such victories would have the same effect, economically, as would direct bombing of the American plants.

When the Soviets judge that they have attained a sufficient lead in applied technology and by their economic war have sufficiently damaged major American industries, then they could conceivably make a quick conversion from the commercial phase back to the military.

It should be remembered, however, that basically Mr. Khrushchev's economic war is favorable in aspect. The Soviets have challenged the West to a race in the field in which the West in general, and the United States and Canada in particular, have done best in the last fifty years. This is in the use of science and technology—particularly in production—to make a better world for mankind.

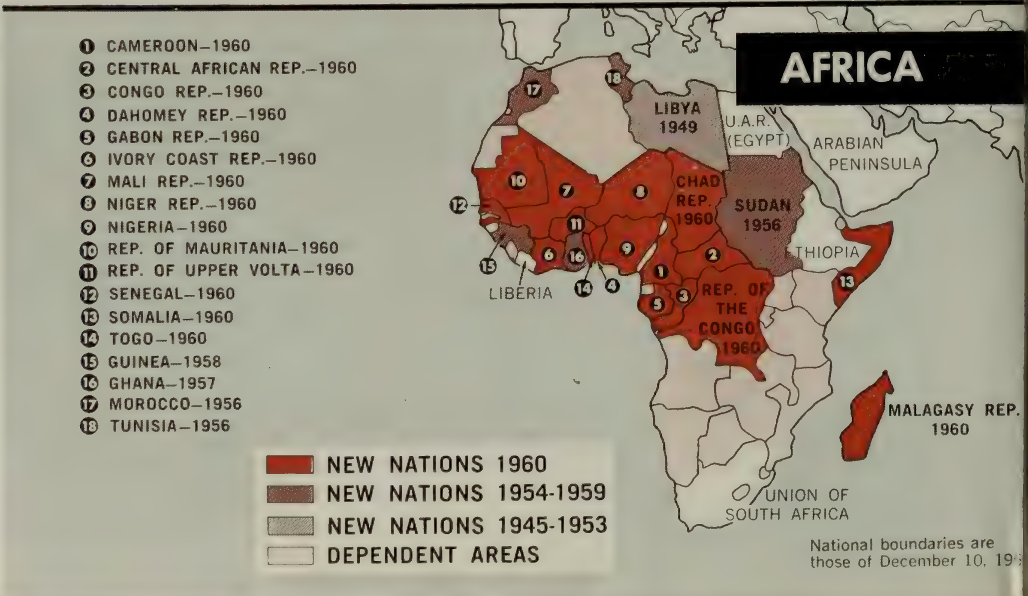
To cope with an entire totalitarian "nation in arms" fighting such an economic war may call for as major a national and allied effort as produced the Allied achievements of World War II. Nevertheless, there appear to be no true defeats in such an economic war, because any advance made by one side can be duplicated quickly by the other, provided that side is sufficiently alert. The contest thus becomes one of creation, not of destruction. To win this war the United States needs only to recognize the changed state of world affairs and to reorganize accordingly. Some of her allies are already reorganized in part as to government-industry relationships, and in a manner adequate for coping with the economic war. With an integration of allied and United States effort, the incalculable can undoubtedly be accomplished. If this is done, at some point along the way "victory" would come to the West.

SWIFT MARCH TOWARD FREEDOM

The world is freeing itself from colonialism at a more rapid pace than could have been predicted before World War II. Within ten years after the war nearly all Asian colonies ruled by Western powers were freed and it has been predicted that Africa will be totally independent by 1965. In 1960 alone eighteen new nations raised their flags over a total area of 4,627,518 square miles with a total population of 81,259,000. These included seventeen countries in Africa and the island of Cyprus.

NEW NATIONS OF 1960

DATE OF INDEPENDENCE	
January 1	CAMEROON FORMERLY, United Nations Trust Territory of French Cameroons. PREMIER: Ahmadou Ahidjo. CAPITAL: Yaoundé. AREA: 166,489 sq. mi. POPULATION: 3,187,000.
April 27	TOGO FORMERLY, United Nations Trust Territory of French Togoland. PREMIER: Sylvanus Olympio. CAPITAL: Lomé. AREA: 21,500 sq. mi. POPULATION: 1,100,000.
June 20	SENEGAL (MALI FEDERATION until August 20, 1960) FORMERLY, Senegal, French West Africa. PREMIER: Mamadou Dia. CAPITAL: Dakar. AREA: 75,750 sq. mi. POPULATION: 2,300,000.
June 20	MALI REPUBLIC (MALI FEDERATION until August 20, 1960) FORMERLY, French Sudan, French West Africa. PREMIER: Modibo Keita. CAPITAL: Bamako. AREA: 148,200 sq. mi. POPULATION: 3,700,000.
June 26	MALAGASY REPUBLIC FORMERLY, Madagascar (French). PRESIDENT: Philibert Tsiranana. CAPITAL: Tananarive. AREA: 227,760 sq. mi. POPULATION: 5,184,000.
June 30	THE REPUBLIC OF THE CONGO FORMERLY, Belgian Congo. PRESIDENT: Joseph Kasavubu CAPITAL: Leopoldville. AREA: 904,754 sq. mi. POPULATION: 13,559,000.
July 1	SOMALIA FORMERLY, United Nations Trust Territory of Italian Somaliland; and British Somaliland Protectorate. PREMIER: Abdi Rashid Shermarke. CAPITAL: Mogadishu. AREA: 262,000 sq. mi. POPULATION: 1,980,000.



August 1 **DAHOMEY REPUBLIC**
FORMERLY, Dahomey, French West Africa.
PREMIER: Hubert Maga.
CAPITAL: Porto-Novo. AREA: 45,560 sq. mi. POPULATION: 1,725,000.

August 3 **NIGER REPUBLIC**
FORMERLY, Niger, French West Africa.
PREMIER: Hammani Diori.
CAPITAL: Niamey. AREA: 449,400 sq. mi. POPULATION: 2,490,000.

August 5 **REPUBLIC OF UPPER VOLTA**
FORMERLY, Upper Volta, French West Africa.
PRESIDENT: Maurice Yemeogo.
CAPITAL: Ouagadougou. AREA: 113,100 sq. mi. POPULATION: 3,736,000.

August 7 **IVORY COAST REPUBLIC**
FORMERLY, Ivory Coast, French West Africa.
PREMIER: Félix Houphouet-Boigny.
CAPITAL: Abidjan. AREA: 127,800 sq. mi. POPULATION: 3,090,000.

August 11 **CHAD REPUBLIC**
FORMERLY, Chad, French Equatorial Africa.
PRESIDENT: François Tombalbaye.
CAPITAL: Fort-Lamy. AREA: 485,750 sq. mi. POPULATION: 2,600,000.

August 13 **CENTRAL AFRICAN REPUBLIC**
FORMERLY, Ubangi-Shari, French Equatorial Africa.
PREMIER: David Dacko.
CAPITAL: Bangui. AREA: 238,220 sq. mi. POPULATION: 1,161,000.

August 15 **CONGO REPUBLIC**
FORMERLY, Middle Congo, French Equatorial Africa.
PRESIDENT AND PREMIER: Fulbert Youlou.
CAPITAL: Brazzaville. AREA: 132,100 sq. mi. POPULATION: 780,000.

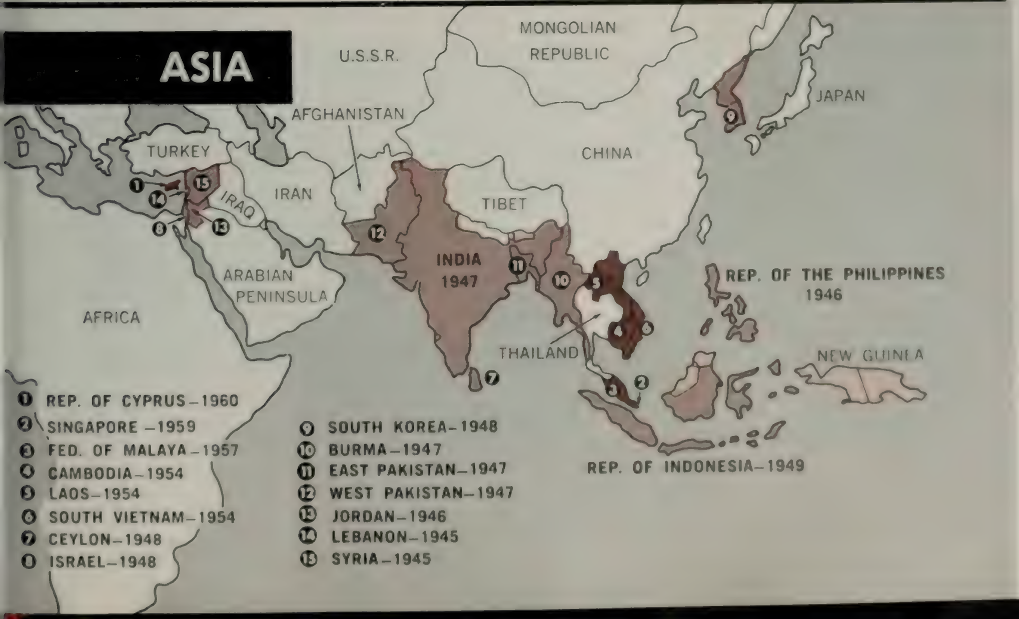
August 16 **REPUBLIC OF CYPRUS**
FORMERLY, British Crown Colony of Cyprus.
PRESIDENT: Archbishop Makarios.
CAPITAL: Nicosia. AREA: 3,572 sq. mi. POPULATION: 558,000.

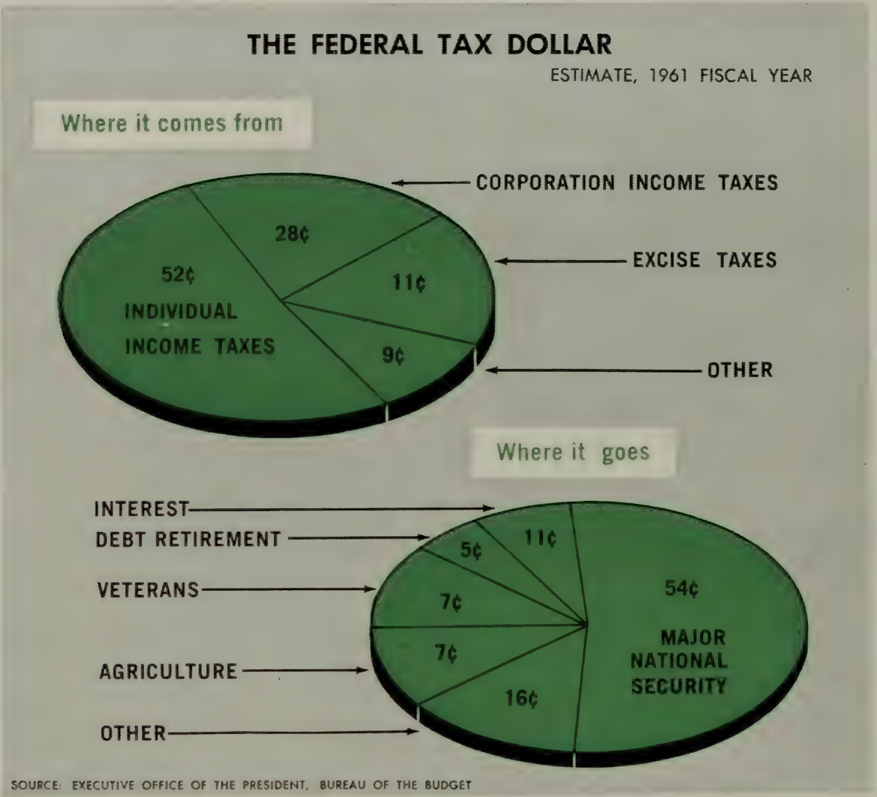
August 17 **GABON REPUBLIC**
FORMERLY, Gabon, French Equatorial Africa.
PREMIER: Léon M'ba.
CAPITAL: Libreville. AREA: 103,089 sq. mi. POPULATION: 417,000.

October 1 **NIGERIA**
FORMERLY, Nigeria (British).
PRIME MINISTER: Alhaji Sir Abubakar Tafawa Balewa.
CAPITAL: Lagos. AREA: 372,674 sq. mi. POPULATION: 33,052,000.

November 28 **REPUBLIC OF MAURITANIA**
FORMERLY, Mauritania, French West Africa.
PREMIER: Mokhtar Ould Daddah.
CAPITAL: Nouakchott. AREA: 449,800 sq. mi. POPULATION: 640,000.

NOTE: All population figures are based on United Nations estimates.





SOURCE: EXECUTIVE OFFICE OF THE PRESIDENT, BUREAU OF THE BUDGET

The Federal Budget

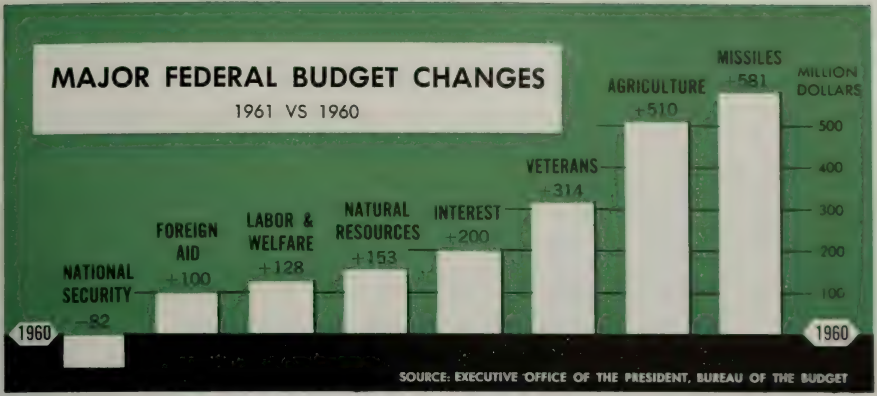
RECEIPTS AND EXPENDITURES SHOWING SURPLUS AND DEFICIT

1957–61 (Fiscal year—ending June 30)

	1957	1959	1961[1]
BUDGET RECEIPTS	$71,029,000,000	$68,270,000,000	$84,000,000,000
BUDGET EXPENDITURES			
National security	43,270,000,000	46,426,000,000	45,568,000,000
International affairs and finance	1,973,000,000	3,780,000,000	2,242,000,000
Veterans services and benefits	4,793,000,000	5,174,000,000	5,471,000,000
Labor and welfare	3,022,000,000	4,421,000,000	4,569,000,000
Agriculture and agriculture resources	4,525,000,000	6,529,000,000	5,623,000,000
Natural resources	1,297,000,000	1,669,000,000	1,938,000,000
Commerce and housing	1,455,000,000	3,421,000,000	2,709,000,000
General government	1,790,000,000	1,606,000,000	1,911,000,000
Interest	7,308,000,000	7,671,000,000	9,585,000,000
TOTAL BUDGET EXPENDITURES	69,433,000,000	80,697,000,000	79,816,000,000[2]
BUDGET SURPLUS (+) OR DEFICIT (−)	+1,596,000,000	−12,427,000,000	+4,184,000,000

[1] Estimated.
[2] Includes also $200,000,000 allowance for contingencies.

SOURCE: Executive Office of the President, Bureau of the Budget



SOURCE: EXECUTIVE OFFICE OF THE PRESIDENT, BUREAU OF THE BUDGET

Distribution of Taxes in the United States

Many public facilities in the United States, such as roads and schools, are financed through joint Federal, state and local co-operation. Government units on these three levels levy taxes which are used to support a variety of projects that no single community could finance alone.

PAYING FOR THE HIGHWAYS

Federal, State and Local Support of Roads

YEAR	FEDERAL FUNDS	STATE FUNDS	LOCAL FUNDS	TOTAL REVENUE COLLECTED
1940	$ 773,000,000	$1,234,000,000	$ 627,000,000	$ 2,634,000,000
1950	471,000,000	2,810,000,000	1,278,000,000	4,559,000,000
1959 [1]	2,985,000,000	5,601,000,000	2,187,000,000	10,773,000,000

[1] Estimated.

SOURCE: *Statistical Abstract of the United States*

TAX MONEY FOR THE SCHOOLS

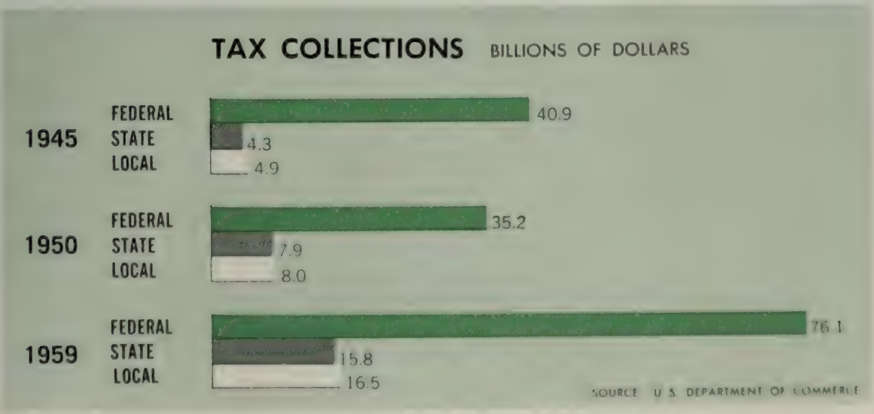
Public Elementary and Secondary School Revenues by Source

SCHOOL YEAR	FEDERAL AID	STATE AID	LOCAL FUNDS	TOTAL REVENUE
1929–30	$ 7,334,000	$ 353,670,000	$1,727,553,000	$ 2,088,557,000
1939–40	39,810,000	684,940,000	1,535,777,000	2,260,527,000
1949–50	155,849,000	2,165,689,000	3,115,507,000	5,437,044,000
1959–60[1]	481,772,000	5,395,876,000	7,594,546,000	13,472,194,000

[1] Estimated.

NOTE: Totals may differ from the sum of their parts because all figures have been rounded off to the nearest thousand.

SOURCES: "Status and Trends: Vital Statistics, Education, and Public Finance" and "Estimates of School Statistics, 1959–60"—Research Division of the National Education Association of the United States



SOURCE U. S. DEPARTMENT OF COMMERCE

FIRST REPORT ON THE UNITED STATES CENSUS

RANK OF 50 LARGEST UNITED STATES CITIES BY POPULATION

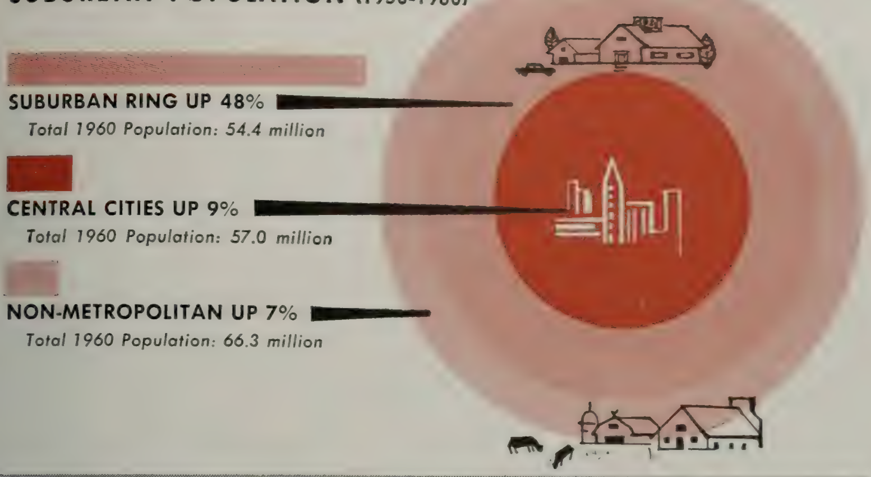
The 50 largest cities of the United States, on the basis of the 1960 census, have a combined population of about 39,000,000. This compares with about 36,000,000 in 1950. Honolulu appears in the ranking of United States cities for the first time, and other new names among the top 50 are Phoenix, El Paso, Tampa and Tulsa. Missing from the 1960 list are Providence, R. I.; Richmond, Va.; Syracuse, N. Y.; and Jacksonville, Fla., which were among the 1950 entries.

The following table shows the 1950 and the 1960 population and rank for the 50 largest United States cities:

	1950		1960	
CITY	RANK	POPULATION	RANK	POPULATION
New York, N. Y.	1	7,891,957	1	7,781,984
Chicago, Ill.	2	3,620,962	2	3,550,404
Los Angeles, Calif.	4	1,970,358	3	2,479,015
Philadelphia, Pa.	3	2,071,605	4	2,002,512
Detroit, Mich.	5	1,849,568	5	1,670,144
Baltimore, Md.	6	949,708	6	939,024
Houston, Texas	14	596,163	7	938,219
Cleveland, Ohio	7	914,808	8	876,050
Washington, D. C.	9	802,178	9	763,956
St. Louis, Mo.	8	856,796	10	750,026
San Francisco, Calif.	11	775,357	11	742,855
Milwaukee, Wis.	13	637,392	12	741,324
Boston, Mass.	10	801,444	13	697,197
Dallas, Texas	22	434,462	14	679,684
New Orleans, La.	16	570,445	15	627,525
Pittsburgh, Pa.	12	676,806	16	604,332
San Antonio, Texas	25	408,442	17	587,718
San Diego, Calif.	31	334,387	18	573,224
Seattle, Wash.	19	467,591	19	557,087
Buffalo, N. Y.	15	580,132	20	532,759
Cincinnati, Ohio	18	503,998	21	502,550
Memphis, Tenn.	26	396,000	22	497,524
Denver, Colo.	24	415,786	23	493,887
Atlanta, Ga.	33	331,314	24	487,455
Minneapolis, Minn.	17	521,718	25	482,872
Indianapolis, Ind.	23	427,173	26	476,258
Kansas City, Mo.	20	456,622	27	475,539
Columbus, Ohio	28	375,901	28	471,316
Phoenix, Ariz.	99	106,818	29	439,170
Newark, N. J.	21	438,776	30	405,220
Louisville, Ky.	30	369,129	31	390,639
Portland, Ore.	29	373,628	32	372,676
Oakland, Calif.	27	384,575	33	367,548
Fort Worth, Texas	38	278,778	34	356,268
Long Beach, Calif.	41	250,767	35	344,168
Birmingham, Ala.	34	326,037	36	340,887
Oklahoma City, Okla.	46	243,504	37	324,253
Rochester, N. Y.	32	332,488	38	318,611
Toledo, Ohio	36	303,616	39	318,003
St. Paul, Minn.	35	311,349	40	313,411
Norfolk, Va.	49	213,513	41	305,872
Omaha, Neb.	40	251,117	42	301,598
Honolulu, Hawaii	44	248,034	43	294,179
Miami, Fla.	42	249,276	44	291,688
Akron, Ohio	39	274,605	45	290,351
El Paso, Texas	76	130,485	46	276,687
Jersey City, N. J.	37	299,017	47	276,101
Tampa, Fla.	85	124,681	48	274,970
Dayton, Ohio	45	243,872	49	262,332
Tulsa, Okla.	52	182,740	50	261,685

SOURCE: Bureau of the Census, United States Department of Commerce

GROWTH RATE OF SUBURBAN POPULATION (1950-1960)



SUBURBAN RING UP 48%

Total 1960 Population: 54.4 million

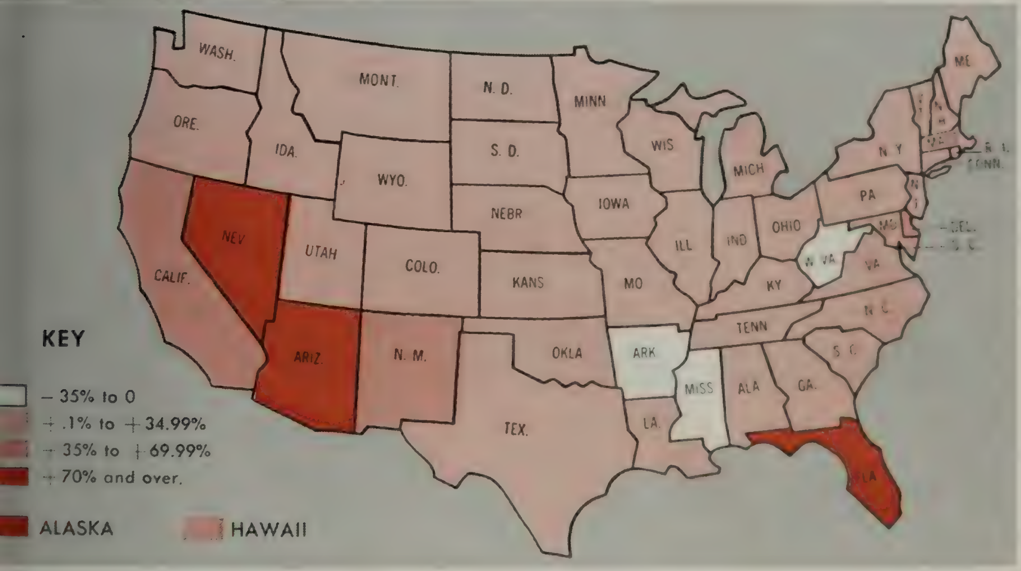
CENTRAL CITIES UP 9%

Total 1960 Population: 57.0 million

NON-METROPOLITAN UP 7%

Total 1960 Population: 66.3 million

POPULATION CHANGES BY STATES



EFFECT ON CONGRESSIONAL REPRESENTATION

STATE	POPULATION 1950	POPULATION 1960	PER CENT OF CHANGE	PRESENT HOUSE SEATS	FUTURE HOUSE SEATS
Alabama	3,061,743	3,266,740	6.7	9	8
Alaska	128,643	226,167	75.8	1	1
Arizona	749,587	1,302,161	73.7	2	3
Arkansas	1,909,511	1,786,272	−6.5	6	4
California	10,586,223	15,717,204	48.5	30	38
Colorado	1,325,089	1,753,947	32.4	4	4
Connecticut	2,007,280	2,535,234	26.3	6	6
Delaware	318,085	446,292	40.3	1	1
Florida	2,771,305	4,951,560	78.7	8	12
Georgia	3,444,578	3,943,116	14.5	10	10
Hawaii	499,794	632,772	26.6	1	2
Idaho	588,637	667,191	13.3	2	2

POPULATION CHANGES BY STATES (cont'd)

STATE	POPULATION 1950	POPULATION 1960	PER CENT OF CHANGE	PRESENT HOUSE SEATS	FUTURE HOUSE SEATS
Illinois	8,712,176	10,081,158	15.7	25	24
Indiana	3,934,224	4,662,498	18.5	11	11
Iowa	2,621,073	2,757,537	5.2	8	7
Kansas	1,905,299	2,178,611	14.3	6	5
Kentucky	2,944,806	3,038,156	3.2	8	7
Louisiana	2,683,516	3,257,022	21.4	8	8
Maine	913,774	969,265	6.1	3	2
Maryland	2,343,001	3,100,689	32.3	7	8
Massachusetts	4,690,514	5,148,578	9.8	14	12
Michigan	6,371,766	7,823,194	22.8	18	19
Minnesota	2,982,483	3,413,864	14.5	9	8
Mississippi	2,178,914	2,178,141	. .	6	5
Missouri	3,954,653	4,319,813	9.2	11	10
Montana	591,024	674,767	14.2	2	2
Nebraska	1,325,510	1,411,330	6.5	4	3
Nevada	160,083	285,278	78.2	1	1
New Hampshire	533,242	606,921	13.8	2	2
New Jersey	4,835,329	6,066,782	25.5	14	15
New Mexico	681,187	951,023	39.6	2	2
New York	14,830,192	16,782,304	13.2	43	41
North Carolina	4,061,929	4,556,155	12.2	12	11
North Dakota	619,636	632,446	2.1	2	2
Ohio	7,946,627	9,706,397	22.1	23	24
Oklahoma	2,233,351	2,328,284	4.3	6	6
Oregon	1,521,341	1,768,687	16.3	4	4
Pennsylvania	10,498,012	11,319,366	7.8	30	27
Rhode Island	791,896	859,488	8.5	2	2
South Carolina	2,117,027	2,382,594	12.5	6	6
South Dakota	652,740	680,514	4.3	2	2
Tennessee	3,291,718	3,567,089	8.4	9	9
Texas	7,711,194	9,579,677	24.2	22	23
Utah	688,862	890,627	29.3	2	2
Vermont	377,747	389,881	3.2	1	1
Virginia	3,318,680	3,966,949	19.5	10	10
Washington	2,378,963	2,853,214	19.9	7	7
West Virginia	2,005,552	1,860,421	−7.2	6	5
Wisconsin	3,434,575	3,951,777	15.1	10	10
Wyoming	290,529	330,066	13.6	1	1
Dist. of Columbia	802,178	763,956	−4.8	. .	. .

SOURCE: Bureau of the Census

GROWTH OF THE UNITED STATES

Census date	Land area in square miles [1] (excluding water areas)	Population (continental United States) [2]	Per cent of increase over preceding census
1790 (August 2)	864,746	3,929,214	——
1800 (August 4)	864,746	5,308,483	35.1
1810 (August 6)	1,681,828	7,239,881	36.4
1820 (August 7)	1,749,462	9,638,453	33.1
1830 (June 1)	1,749,462	12,866,020	33.5
1840 (June 1)	1,749,462	17,069,453	32.7
1850 (June 1)	2,940,042	23,191,876	35.9
1860 (June 1)	2,969,640	31,443,321	35.6
1870 (June 1)	2,969,640	39,818,449	26.6
1880 (June 1)	2,969,640	50,155,783	26.0
1890 (June 1)	2,969,640	62,947,714	25.5
1900 (June 1)	2,969,834	75,994,575	20.7
1910 (April 15)	2,969,565	91,972,266	21.0
1920 (January 1)	2,969,451	105,710,620	14.9
1930 (April 1)	2,977,128	122,775,046	16.1
1940 (April 1)	2,977,128	131,669,275	7.2
1950 (April 1)	2,974,726	150,697,361	14.5
1960 (April 1)	3,548,913	179,323,175	18.5

[1] Figures on which population density is based. Since 1860 changes in land areas have resulted from dam construction or drainage projects. 1960 figure includes Alaska and Hawaii.
[2] Except for 1960 when Alaska and Hawaii were included.

SOURCE: Bureau of the Census

THE 1959 SOVIET CENSUS

The latest census statistics graphically reveal the man-power problem facing the Soviet Union today. The tremendous number of casualties during World War II is reflected in the large discrepancy between the number of men and women in the over-thirty-two age group. A marked decline in the birth rate and a great increase in infant mortality occurred during and immediately following the war. As a result, only a few hundred thousand people will be added annually to the labor force in the next ten years, in contrast to the previous annual increase of 1,000,000 to 2,000,000. These changes in population growth may well have played a role in the basic Soviet policy decisions to reduce the size of the armed forces by a third and to combine education with labor activities.

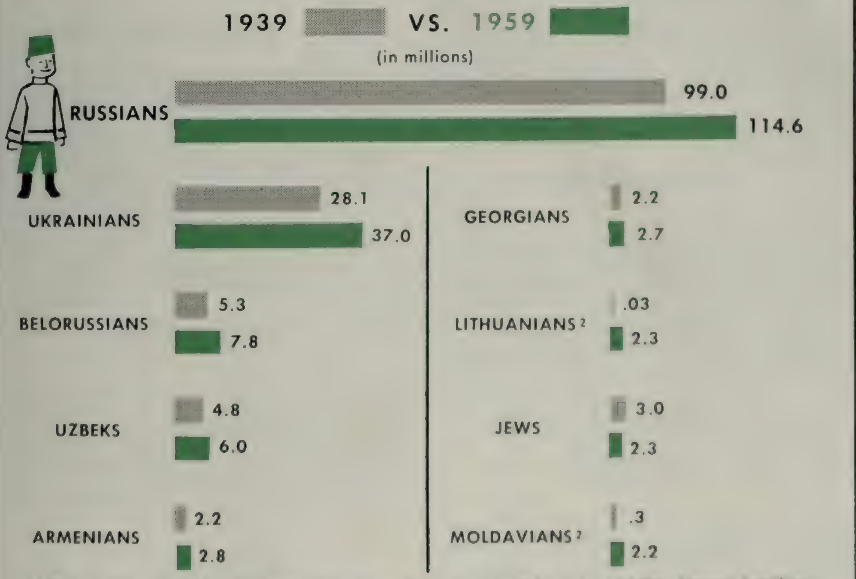
SOME BASIC FACTS REVEALED BY THE CENSUS

1939 CENSUS	1959 CENSUS
POPULATION—170,467,186	POPULATION—208,826,650
EXCESS OF FEMALES—7,200,000	EXCESS OF FEMALES—20,800,000
URBAN POPULATION—55,909,908 (32.8 per cent)	URBAN POPULATION—99,977,695 (43 per cent)
ILLITERACY—18.8 per cent	ILLITERACY—1.5 per cent
COLLEGE GRADUATES—1,200,000	COLLEGE GRADUATES—3,800,000
DEATH RATE (in 1938)—17.8 per thousand	DEATH RATE—7.2 per thousand

Russians in the Soviet Union

The latest Soviet census clearly shows an increase in number of Russians (descendants of the Slavic people who originally settled Russia) in the Soviet Union's non-Russian republics. This is due in part to the policy of the "conquest of virgin lands," which has sent technicians, scientists and settlers to the less-developed areas of the Soviet Union. As a result, Russians now outnumber the natives in the Central Asian republic of Kazakhstan. In most other republics Russians are now an important minority.

CHANGES IN SOVIET POPULATION, BY NATIONALITIES[1]



[1] Other nationalities, for which population figures were not available prior to 1959: Tartars, 5 million; Kazakhs, 3.6 million; Azerbaijani, 2.9 million.

[2] The acquisition of Lithuania and a large section of Rumania in 1940 brought many more Lithuanians and Moldavians (a Rumanian subgroup) into the Soviet Union.

Source: *Statistical Abstract*

THE POPULATION OF CANADA

Canada is one of the more sparsely settled countries of the world, but its population is rapidly increasing—especially in the western province of British Columbia. To keep track of these population changes, the Government has adopted the practice of taking a census every five years, twice as often as does the United States. A full count, however, that includes such subsidiary items as housing and wages, is taken only in every other census.

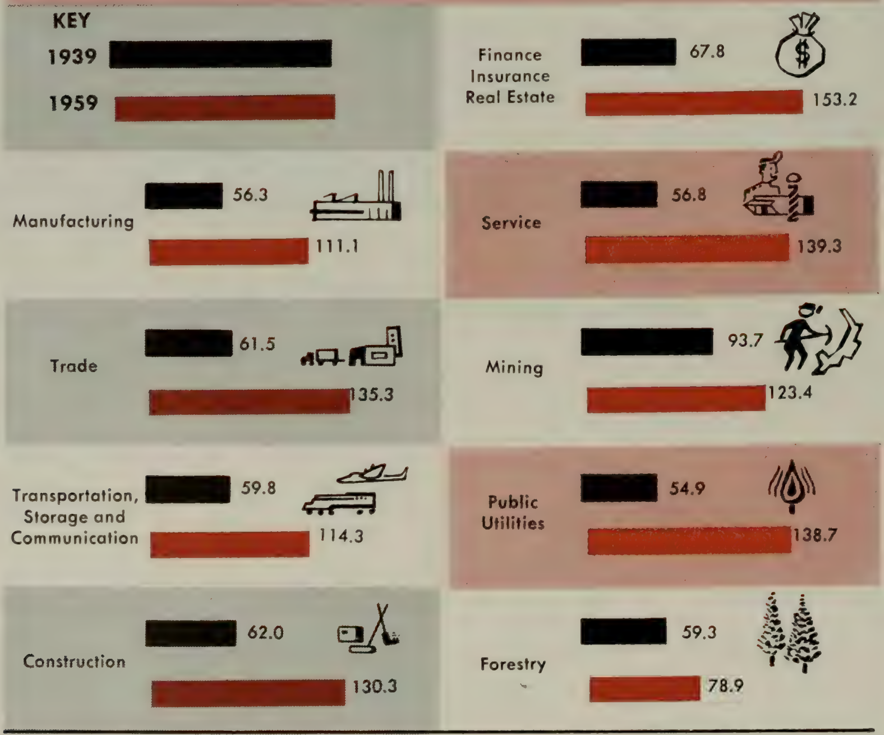
CANADA'S POPULATION BY PROVINCE

	1939	1944	1949	1954	1959
ALBERTA	786,000	808,000	885,000	1,057,000	1,243,000
BRITISH COLUMBIA	792,000	932,000	1,113,000	1,295,000	1,570,000
MANITOBA	726,000	727,000	757,000	823,000	885,000
NEW BRUNSWICK	447,000	461,000	508,000	540,000	590,000
NEWFOUNDLAND	298,000	316,000	345,000	395,000	449,000
NOVA SCOTIA	561,000	611,000	629,000	673,000	716,000
ONTARIO	3,708,000	3,963,000	4,378,000	5,115,000	5,952,000
PRINCE EDWARD ISLAND	94,000	91,000	94,000	101,000	102,000
QUEBEC	3,230,000	3,500,000	3,882,000	4,388,000	4,999,000
SASKATCHEWAN	906,000	836,000	832,000	873,000	902,000
YUKON AND NORTHWEST TERRITORIES	17,000	17,000	24,000	27,000	34,000
TOTAL	11,267,000[1]	11,946,000[1]	13,447,000	15,287,000	17,442,000

[1] As Newfoundland did not become part of Canada until 1949, its population is not included in the totals for 1939 and 1944.

EMPLOYMENT IN CANADA BY MAJOR INDUSTRY

Index Base: 1949 = 100



Source: *Dominion Bureau of Labor Statistics*

CANADA'S POPULATION BY AGE GROUPS

	1941		1959[1]	
	NUMBER	PER CENT	NUMBER	PER CENT
Preschool and school-age children (0–19)	4,318,586	37.5	7,137,800	40.9
Working-age population (20–64)	6,420,254	55.8	8,989,700	51.6
Older persons (65 and older)	767,815	6.7	1,314,500	7.5
TOTAL	11,506,655	100.0	17,442,000	100.0

[1] Estimated.

BIRTH, MARRIAGE AND DEATH IN CANADA

	1949	1955	1959[1]
Number of births	367,100	442,900	486,000
Birth rate per thousand	27.3	28.2	27.9
Number of marriages	124,100	128,000	127,000
Marriage rate per thousand	9.2	8.2	7.3
Number of deaths	124,600	128,500	141,000
Death rate per thousand	9.3	8.2	8.1

[1] Estimated.

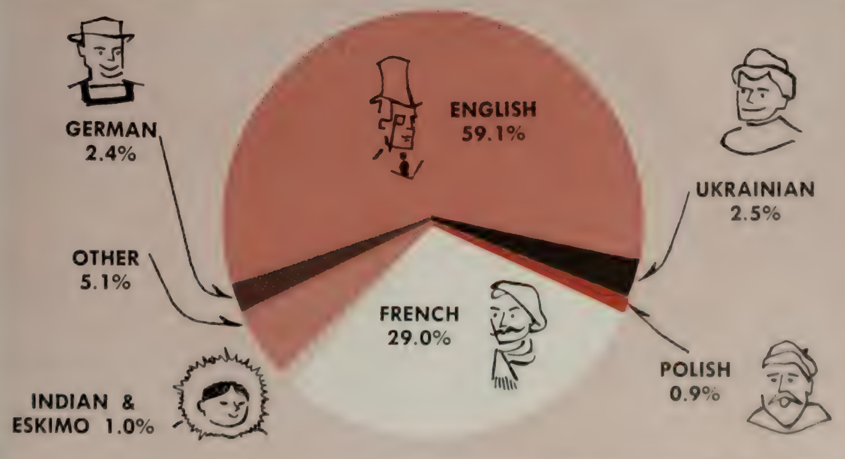
CANADIAN IMMIGRATION

Number of Admissions by Country of Last Permanent Residence

YEAR	FROM THE UNITED KINGDOM	FROM THE UNITED STATES	FROM WEST GERMANY	FROM ITALY	FROM THE NETHERLANDS	OTHERS	TOTAL
1945	10,790	6,394	37	12	9	5,480	22,722
1949	20,737	7,756	2,941	7,728	6,828	49,227	95,217
1953	46,793	9,407	34,193	23,704	20,341	34,430	168,868
1957	108,989	11,008	28,430	27,740	11,934	94,063	282,164
1959	18,222	11,338	10,423	25,655	5,243	36,047	106,928

SOURCE, ALL TABLES: Dominion Bureau of Statistics

MOTHER TONGUES* OF CANADA'S POPULATION



*Languages first spoken in childhood and still used.

Source: *Canada Year Book*

THE 1960 UNITED STATES ELECTIONS

GUBERNATORIAL AND CONGRESSIONAL ELECTIONS

Alabama
Senator: John Sparkman, Dem. (incumbent)
House: 9 Dem.

Alaska
Senator: E. L. Bartlett, Dem. (incumbent)
House: One Dem.

Arizona
Governor: Paul Fannin, Rep. (incumbent)
House: One Dem., one Rep.

Arkansas
Governor: Orval E. Faubus, Dem. (incumbent)
Senator: John L. McClellan, Dem. (incumbent)
House: 6 Dem.

California
House: 16 Dem., 14 Rep.

Colorado
Senator: Gordon Allott, Rep. (incumbent)
House: 2 Dem., 2 Rep.

Connecticut
House: 4 Dem., 2 Rep.

Delaware
Governor: Elbert N. Carvel, Dem. (party change)
Senator: J. Caleb Boggs, Rep. (party change)
House: One Dem.

Florida
Governor: C. Farris Bryant, Dem.
House: 7 Dem., one Rep.

Georgia
Senator: Richard B. Russell, Dem. (incumbent)
House: 10 Dem.

Hawaii
House: One Dem.

Idaho
Senator: Henry C. Dworshak, Rep. (incumbent)
House: 2 Dem.

Illinois
Governor: Otto Kerner, Jr., Dem. (party change)
Senator: Paul H. Douglas, Dem. (incumbent)
House: 14 Dem., 11 Rep.

Indiana
Governor: Matthew Welsh, Dem. (party change)
House: 3 Dem., 7 Rep., one undecided

Iowa
Governor: Norman A. Erbe, Rep. (party change)
Senator: Jack R. Miller, Rep.
House: 2 Dem., 6 Rep.

Kansas
Governor: John Anderson, Rep. (party change)
Senator: Andrew F. Schoeppel, Rep. (incumbent)
House: one Dem., 5 Rep.

Kentucky
Senator: John Sherman Cooper, Rep. (incumbent)
House: 7 Dem., one Rep.

Louisiana
Senator: Allen J. Ellender, Dem. (incumbent)
House: 8 Dem.

Maine
Governor: John H. Reed, Rep. (incumbent)
Senator: Margaret Chase Smith, Rep. (incumbent)
House: 3 Rep.

Maryland
House: 6 Dem., one Rep.

Massachusetts
Governor: John A. Volpe, Rep. (party change)
Senator: Leverett Saltonstall, Rep. (incumbent)
House: 8 Dem., 6 Rep.

Michigan
Governor: J. B. Swainson, Dem.
Senator: Patrick V. McNamara, Dem. (incumbent)
House: 7 Dem., 11 Rep.

Minnesota
Governor: E. L. Andersen, Rep. (party change)
Senator: Hubert Humphrey, Dem. (incumbent)
House: 3 Dem., 6 Rep.

Mississippi
Senator: James O. Eastland, Dem. (incumbent)
House: 6 Dem.

Missouri
Governor: John M. Dalton, Dem.
Senator: Edward V. Long, Dem.
House: 9 Dem., 2 Rep.

Montana
Governor: Donald G. Nutter, Rep.
Senator: Lee Metcalf, Dem.
House: One Dem., one Rep.

Nebraska
Governor: Frank Morrison, Dem. (party change)
Senator: Carl T. Curtis, Rep. (incumbent)
House: 4 Rep.

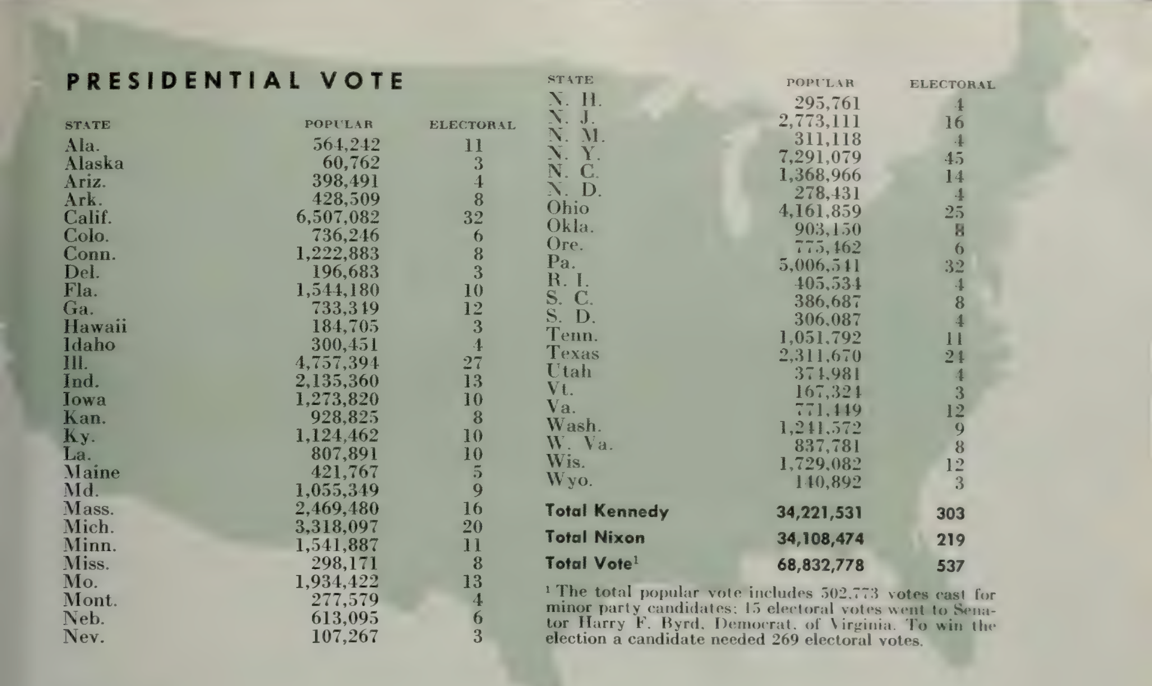
Nevada
House: One Dem.

New Hampshire
Governor: Wesley Powell, Rep. (incumbent)
Senator: Styles Bridges, Rep. (incumbent)
House: 2 Rep.

New Jersey
Senator: Clifford P. Case, Rep. (incumbent)
House: 6 Dem. 8 Rep.

New Mexico
Governor: Edwin L. Mechem, Rep. (party change)
Senator: Clinton P. Anderson, Dem. (incumbent)
House: 2 Dem.

PRESIDENTIAL VOTE



STATE	POPULAR	ELECTORAL
Ala.	564,242	11
Alaska	60,762	3
Ariz.	398,491	4
Ark.	428,509	8
Calif.	6,507,082	32
Colo.	736,246	6
Conn.	1,222,883	8
Del.	196,683	3
Fla.	1,544,180	10
Ga.	733,349	12
Hawaii	184,705	3
Idaho	300,451	4
Ill.	4,757,394	27
Ind.	2,135,360	13
Iowa	1,273,820	10
Kan.	928,825	8
Ky.	1,124,462	10
La.	807,891	10
Maine	421,767	5
Md.	1,055,349	9
Mass.	2,469,480	16
Mich.	3,318,097	20
Minn.	1,541,887	11
Miss.	298,171	8
Mo.	1,934,422	13
Mont.	277,579	4
Neb.	613,095	6
Nev.	107,267	3
N. H.	295,761	4
N. J.	2,773,111	16
N. M.	311,118	4
N. Y.	7,291,079	45
N. C.	1,368,966	14
N. D.	278,431	4
Ohio	4,161,859	25
Okla.	903,150	8
Ore.	775,462	6
Pa.	5,006,541	32
R. I.	405,534	4
S. C.	386,687	8
S. D.	306,087	4
Tenn.	1,051,792	11
Texas	2,311,670	24
Utah	374,981	4
Vt.	167,324	3
Va.	771,449	12
Wash.	1,241,572	9
W. Va.	837,781	8
Wis.	1,729,082	12
Wyo.	140,892	3
Total Kennedy	**34,221,531**	**303**
Total Nixon	**34,108,474**	**219**
Total Vote[1]	**68,832,778**	**537**

[1] The total popular vote includes 502,773 votes cast for minor party candidates; 15 electoral votes went to Senator Harry F. Byrd, Democrat, of Virginia. To win the election a candidate needed 269 electoral votes.

New York

House: 22 Dem. 21 Rep.

North Carolina

Governor: Terry Sanford, Dem.
Senator: B. Everett Jordan, Dem. (incumbent)
House: 11 Dem., one Rep.

North Dakota

Governor: William L. Guy, Dem. (party change)
House: 2 Rep.

Ohio

House: 7 Dem., 16 Rep.

Oklahoma

Senator: Robert S. Kerr, Dem. (incumbent)
House: 5 Dem., one Rep.

Oregon

Senator: Maurine B. Neuberger, Dem.
House: 2 Dem., 2 Rep.

Pennsylvania

House: 14 Dem., 16 Rep.

Rhode Island

Governor: John A. Notte, Dem. (party change)
Senator: Claiborne de Borda Pell, Dem.
House: 2 Dem.

South Carolina

Senator: Strom Thurmond, Dem. (incumbent)
House: 6 Dem.

South Dakota

Governor: Archie Gubbrud, Rep. (party change)
Senator: Karl E. Mundt, Rep. (incumbent)
House: 2 Rep.

Tennessee

Senator: Estes Kefauver, Dem. (incumbent)
House: 7 Dem., 2 Rep.

Texas

Governor: Price Daniel, Dem. (incumbent)
Senator: Lyndon B. Johnson, Dem. (incumbent)
House: 21 Dem., one Rep.

Utah

Governor: George D. Clyde, Rep. (incumbent)
House: 2 Dem.

Vermont

Governor: F. Ray Keyser, Jr., Rep.
House: One Rep.

Virginia

Senator: A. Willis Robertson, Dem. (incumbent)
House: 8 Dem., 2 Rep.

Washington

Governor: A. D. Rosellini, Dem. (incumbent)
House: 2 Dem., 5 Rep.

West Virginia

Governor: William W. Barron, Dem. (party change)
Senator: Jennings Randolph, Dem. (incumbent)
House: 5 Dem., one Rep.

Wisconsin

Governor: Gaylord Nelson, Dem. (incumbent)
House: 4 Dem., 6 Rep.

Wyoming

Senator: Keith Thomson, Rep. (died Dec. 9); Gov. J. J. Hickey, Dem., appointed
House: One Rep.

UNITED STATES TOTALS

Governors: 34 Dem., 16 Rep.

Senate: 65 Dem., 35 Rep.

House: 262 Dem., 174 Rep., 1 undecided

MEN, MONEY and MACHINES

AVIATION

Air Taxis
Julius Goldman 160
Private Flying
W. T. Piper, Jr. 162
Faster Air Travel—on the Ground
C. R. Smith 164
Aviation in 1960
Laurence L. Doty, Jr. 166

BUSINESS AND FINANCE

Consumer Credit
John W. Hazard 169
Conventions Are Big Game
Charles Paul May 173
Japan—World Trader
Dorothy Carew 176
Finding the Right Man
Joseph S. Rosapepe 179

INDUSTRY

Explosives Up-to-Date
Edmund Grekulinski 182
Miniature Giants
Bryan Bunch 185
Canada Boosts Gas Exports
Tania Long 188

MODERN TRENDS ON THE HIGHWAY

Safety on the Highways
Howard Pyle 191
Motels Come of Age
Dorothy C. Rosapepe 194

FACTS AND FIGURES

Employment Patterns in the United States—Past and Future 198
Balance of Trade 200
Advertising in the United States .. 202
Private Flying in the United States 204
Motor-Vehicle Accidents in the United States 205
Health Insurance and Medical Costs in the United States 206
United States Labor: Union Membership and Work Stoppages 208
China's Growth and the Early Soviet Rate 209
The Economy of Latin America ... 210

H. ARMSTRONG ROBERTS
AMERICAN IRON & STEEL INSTITUTE
BOEING AIRPLANE COMPANY
REPUBLIC AVIATION

AIR TAXIS

By JULIUS GOLDMAN

President
National Air Taxi Conference

TRAVELERS in the United States are becoming increasingly aware of the varied services offered them by the air-taxi companies, which widely supplement those offered by the airlines. The airlines, of course, are the leaders in public transportation and carry more than half of the free world's air-passenger traffic. There are, however, many towns and small communities that neither are nor can be served by them. This may be because of lack of proper airport facilities or because of the economic problem with which the airlines would be faced in trying to provide service with frequent stops over short distances and with small passenger pay loads. For the many people clamoring for air transportation involving these and other special problems the answer is service by air taxi.

Air-taxi service has been with us for a long time. Businessmen became accustomed to using this method of transportation when they wanted to call on customers in small towns where no airliner stopped. The demand for the service grew and, with it, the number of air-taxi operators. In February 1950 these operators banded together to form the co-operative and nonprofit National Air Taxi Conference, with headquarters in Washington, D. C. They realized that by working together they could do much more to improve air-taxi service than if improvements were left to the individual operators. To obtain the approval, confidence and acceptance of the scheduled airlines and the traveling public, special standards of operation were established. The members pledged themselves to maintain high standards of safety, reliability, efficiency, honesty and courtesy.

Business people find that an air taxi is the next-best thing to a personally owned or company plane. A regional representative of a cosmetic company, for instance, is a regular air-taxi passenger. She frequently flies, in one day, from Washington, D. C., to Charlottesville, Roanoke and Richmond in Virginia, as well as to other, smaller cities, stopping for an hour at each place to talk to her customers. To do this, she has only to call her local air-taxi operator, who furnishes a pilot and an aircraft of her choice. She makes these widely separated calls in one third of the time it would take by automobile and also saves food and hotel costs.

Air taxis are also used constantly to take people from their homes to major airline terminals fifty or a hundred miles away, eliminating long drives, traffic delay, changes from one form of transportation to another and troublesome arrangements about baggage. The customers can set their own departure time, be picked up at the nearest flying field and be air-taxied to the airport from which their scheduled flight will depart.

One of the most rapidly growing uses for this type of service is for speeding air cargo to its final destination. One NATC member has a contract with a photo-service company for picking up film at a central point and delivering it to the processing center, thus making 24-hour photo service possible. This involves a daily 210-mile air-taxi flight, 5 days a week. Two members work both under contract and on call with the Atomic Energy Commission and their affiliated contractors at various reactor installations throughout the United States. In addition to hauling personnel and cargo they carry radioactive isotopes and other high-priority materials.

Air Ambulance, another National Air Taxi service, is much in demand. One conference member has altered a late-model twin-engine Piper Apache for air-ambulance service, with the latest instruments, radios and other safety and navigational equipment, including an automatic pilot. The patient is loaded aboard while lying flat on a stretcher, where he may remain from hospital bed to hospital bed. A nurse's chair is mounted on a floor track and may be moved the length of the cabin during flight; another passenger may be carried at no additional charge. Air-ambulance trips from Florida to New York and Canada have become commonplace.

One of NATC's first goals was to establish an agreement with the scheduled airlines to interchange passengers and to provide service to and from communities not served by scheduled carriers. To accomplish this not only were high operating standards required for conference membership but members had to carry a minimum of $40,000 passenger-seat liability insurance. Evidence of a currently effective Federal Aviation Agency operating certificate was also necessary. The NATC entered into agreement with twenty-four of the major scheduled airlines. Now a passenger can fly all the way to his destination—by airline and by air taxi. He can make his air reservations through the airline, his travel agent or through a NATC member.

The Beech Bonanza, Cessna 180 and 182 and the Piper Tri-Pacer, which are typical of the aircraft used in air-taxi service, carry three passengers and a pilot. The twin-engine models of Beech, Cessna, Piper and the Aero Commander carry four, five or six passengers and the pilot; almost all are speedier and cut down on flying time but at a slightly higher fare. Rates are based on mileage or a graduated zone rate and vary somewhat according to the operator and the type of craft used. NATC member companies are listed in the Official Airline Guide, showing rates and the type of equipment used.

Members of the NATC have a first-rate safety record. In the four-year period 1955–59 the 143 member companies flew 25,379,286 revenue miles, made 138,544 trips and carried 308,804 passengers without an injury or fatality.

At a flying field near home, mother and father load baby sister into an air taxi before they start off.

DORN'S PHOTO SHOP

PRIVATE FLYING

PIPER AIRCRAFT

By W. T. PIPER, JR.

Executive Vice-President
PIPER AIRCRAFT CORPORATION

AT approximately 3 P.M. on June 4, 1959, a small, sleek plane approached the bustling Los Angeles airport; the pilot asked for landing instructions. Few of the people crowding the terminal noticed the plane's approach, but to the men in the tower and to a group of newsmen this was headline news. The arrival of the plane marked the completion of a world-record distance flight for small planes and wrote a new page in aviation history. For Max Conrad, a grandfather, the landing of his Piper Comanche was the end of a 7,668-mile solo flight, nonstop from Casablanca, Morocco. Just 58 hours and 38 minutes earlier, Conrad's plane had roared off the North African airport on its epochal journey, which a few years earlier would have seemed impossible.

Much aviation development since the Wright brothers flew their first airplane in 1903 has been the result of progress in two world wars, especially during World War II. Progress, however, has not been limited to military planes but has affected all types of engines, fuel, instruments and electronics. Many of these advances are reflected in vastly improved small or personal planes.

Private flying—known as general aviation—is one of the three major divisions of over-all aviation; the other two are airline flying and military aviation. General aviation involves flight instruction, charter flying, pleasure flying, agricultural dusting and spraying and the phenomenally expanding activity known as business flying. In number of aircraft, hours flown and pilots, general aviation is by far the largest part of American aviation.

At present there are more than 100,000 civil aircraft registered with the Federal Aviation Agency; of these, about 72,500 are in active use. Approximately 1,900 are airliners. The National Business Aircraft Association estimates that of the private planes about 30,000 are used primarily for business purposes. Of these business planes, over 6,000 are multi-engine machines. The NBAA also estimates that more than 2,000,000 more hours are spent annually in business flying than in airline flying.

In Canada, new pilots' licenses, about 80 per cent for private pilots, are being issued at a rate of about twenty-five a week. The registration of privately owned aircraft is shooting upward at about ten a week.

Since the early 1950's, faster airplanes with greater seating capacity have been developed. Significant is the achievement of high-performance, single-engine aircraft that cruise at speeds of between 150 and 200 miles per hour. Smaller and well-equipped four-place planes, to cruise between 125 and 150 miles per hour, are also available at considerably less cost.

Perhaps the outstanding accomplishment in the past ten years has been the development of relatively low-cost, high-performance twin-engine aircraft which have made possible night-and-day, bad-weather operations. Cessna's model 310 and the Aero Commander have both been exceedingly popular small twins. Beech Aircraft is manufacturing five different twin-engine models, from the four- or five-place Travel Air to a twin-jet machine. Piper Aircraft's Apache model is the lowest-priced twin on the market and has consequently sold in larger numbers than its competitors. A more powerful version of the Apache is Piper's new Aztec, designed to cruise at 205 miles per hour and to perform exceptionally well at high altitudes.

In addition, there are specialty aircraft such as Beech's Mentor, a two-place trainer; Piper's Pawnee, designed solely for spraying and dusting; and Cessna's L-19, basically an Army liaison plane. There are also a number of very expensive airline-type planes used by the larger business companies but out of reach of the average buyer. These include the Grumman Gulfstream, Fairchild's F-27 and the Lockheed JetStar.

The cost of operating an airplane varies with its size, speed and horsepower. A typical four-place, privately owned airplane is the Piper Caribbean. The list price, without equipment, is $8,795 for the standard model and $9,750 complete with radio for navigation and communications. Direct costs, which include fuel, maintenance and a reserve for engine overhaul, are estimated at $5.53 for each hour of flying. Indirect expenditures, which include hangar rent and insurance, will cost annually approximately $997.75. Based on 300 hours of flying annually, the operating costs for each mile at 125 mph will be only 7.1 cents. Obviously, more or less flying hours will decrease or increase the cost per mile. Depreciation costs, based on five years' operation, will add 3.8 cents, making a total of 10.9 cents per mile.

Becoming a pilot is not the superhuman achievement that we were led to believe thirty years ago. Men and women of all ages have become excellent pilots. The main requirement for obtaining a private pilot's license is forty hours of dual and solo flying. The cost averages between $400 and $600, depending on the type of equipment and the location of the airport. The Federal Aviation Agency recently revised its regulation, making mandatory a few hours of dual instruction on instrument flying. The number of student pilots continues to increase annually and in 1957 there were about 77,000 applications for student permits. Cross-country flying has been simplified, making it much easier for the less experienced pilots. Radios tell the pilot in which direction he must go and where he is at all times. Light and inexpensive automatic pilots are not only very helpful on long trips but extremely valuable as an extra measure of safety.

One of the big problems at present is the shortage of airports. There are about 7,000 landing fields in the United States but 18,000 to 20,000 are needed. As the number of airports increases, so does the utility of the private plane.

FASTER AIR TRAVEL

—on the Ground

By C. R. SMITH

President

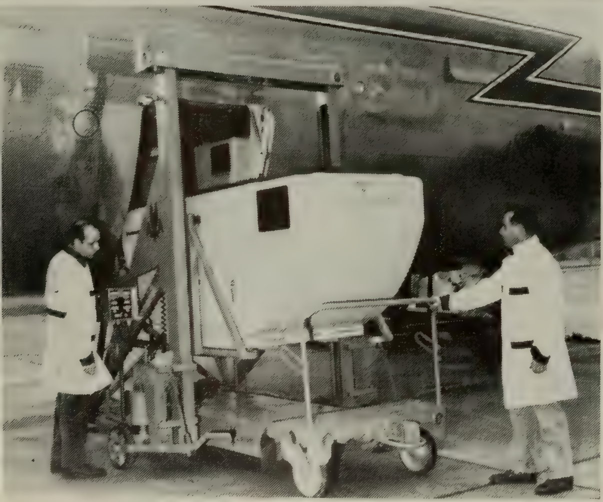
American Airlines, Inc.

AIR travel has become very much faster and more comfortable since the advent of the jet age. Some commercial jetliners, for instance, have flown from Los Angeles to New York City in even less than four hours. This is a reduction of more than 40 per cent from the time taken by propeller-driven aircraft on coast-to-coast flights. In addition to providing greater speed, the jetliners offer the advantages of less noise and less vibration and consequently less fatigue for the passenger.

The airlines are working to achieve for their passengers speed and comfort on the ground as well, in all the varied activities that go on before the traveler boards his plane and just after he leaves it. Many new jet-age passenger services are now being put into operation by most major United States airlines; they include among other advances easier ways of making reservations and of handling baggage.

Mechanized baggage systems not only shorten the time between landing and baggage delivery, but they also offer added protection for luggage.

AMERICAN AIRLINES



Because of the enormous volume of airline reservations this aspect of the industry has always posed many problems. At American Airlines alone, the reservations telephones ring about 45,000 times a day. The reservations clerks throughout the entire industry answer the telephone about 80,000,000 times a year. It is estimated that by 1970 the number of "answerings" may have increased to about 135,000,000.

Despite unusually effective organization within the industry, there is always, in any airline company, a certain unavoidable percentage of human error in filling out reservations. American Airlines hopes to eliminate these irritating errors almost entirely with a new electronic system called SABRE, which will handle reservations under the direction of the most modern computers. SABRE is expected to go into operation this year. Information concerning seating space will then be available to the customer probably in seconds because of the almost unbelievable speed with which the electronic system will list cancellations. Clerical errors will be virtually abolished because records will be kept in the phenomenal "memory" of the computer.

Many improvements are being made in ticketing. A passenger today can subscribe to any one of several plans for charging his flights—depending on the airline with which he is flying. He can

PORT OF NEW YORK AUTHORITY

Lines of immigrants pass swiftly through New York International Airport.

literally write his own ticket. When he wishes to fly he merely telephones for a reservation and fills in one of the blank tickets in a little book that he has previously obtained from the airline. He presents this ticket at the gate and boards his plane, secure in the knowledge that he will have a seat. On two lines at least there is a plan that permits the traveler to purchase his ticket on the plane, provided of course that there is empty space. Allegheny Airlines' Air Commuter Service allows the passenger to purchase a book of ten tickets, much like a commuter's train ticket, to a certain destination. No reservations have to be made in connection with this plan although it is recommended that a passenger call the airline to make sure that space is available.

The year 1959 saw the beginning of teleticketing—a system for printing air-travel tickets in business offices where employees do a great deal of flying. This system was developed by American Airlines and utilizes teletype circuits linked to modified receivers that are placed in business offices where this service is desired. The information that must go on the ticket is relayed to the receiver from a machine in the airline office. The first two copies of each teleticket, as it emerges from the machine, are auditors' coupons, one to be returned to the airline with payment and the other for internal auditing by the company using the ticket. In this way, accounting is reduced to its simplest form. The remaining parts of the ticket are flight coupons and the passenger's receipt. Since the operation is mechanical, there is little margin for error and, of course, the whole process is much quicker and easier than buying a ticket at the airline office. For volume users of air transportation this method is less expensive.

The airlines have progressed recently in the handling of baggage. For jet service on American and United the baggage-delivery system has already been mechanized and allows the passenger to obtain his luggage almost immediately after touchdown. Some airlines also allow the passenger to carry his own bags on and off the plane, eliminating long delays.

In the earlier days of air transportation, terminal facilities were often decidedly primitive. Not all are fully modernized today, but the number of obviously inadequate terminals is decreasing rapidly. Even in such modern airports as New York's International, which was built only thirteen years ago, extensive recent additions have resulted in much greater comfort and convenience for travelers. The transition in most new airports from the bleakness and crowding of the past to the attractive, commodious accommodations of the present is doing much to increase the volume of air travel generally.

Obviously, improvement in conditions at airports and in flight depends largely upon the funds available to the airlines; these funds depend, in turn, upon the income derived from passenger traffic. In 1959 the domestic trunk lines of the United States achieved a total record of 30,000,000,000 passenger-miles. By the end of 1964 this is expected to reach a total of 44,000,000,000 passenger-miles. Thousands of people are flying today who never flew before.

AVIATION in 1960

By LAURENCE L. DOTY, JR.

Transport Editor
Aviation Week

SUD AVIATION

ON May 1, a Lockheed U-2, piloted by Francis Gary Powers, crashed about 1,200 miles inside the Soviet Union, near Sverdlovsk in the Ural Mountains region. The Russians claimed that the plane had been shot down by Soviet ground forces. It was later disclosed that it had been on a United States reconnaissance flight over the heart of Russia and that such flights had been going on since 1956. Powers was subsequently convicted of espionage by a Russian court. The U-2 incident resulted in a bitter split between Soviet Premier Khrushchev and President Eisenhower and in the collapse of the summit conference scheduled to be held in Paris in June.

The U-2 was designed in 1954 as a high-altitude reconnaissance aircraft powered by a single Pratt & Whitney J75 turbojet engine. It has a maximum altitude of approximately 90,000 feet and a top speed at this altitude of about 500 miles per hour true air speed (speed in relation to the air, not to the ground). To provide savings in structural weight, the U-2 drops its wing landing wheels after take-off and, upon landing, the pilot normally turns off the runway onto grass and heels over on one wing-tip skid. The plane has a sailplane-type wing and the fuselage is bullet-shaped, with flush riveting used over most of the aircraft to provide a smooth surface that reduces friction drag at high altitudes. The main engine inlets are exceptionally large for a single-engine aircraft. These planes are "hand built."

The Soviets were less successful in aviation in 1960 than earlier publicity billings of their aircraft development had once suggested. The highly trumpeted Tu-114, promoted as the world's largest turboprop transport, had not seen regular service as the year came to a close. The popular though smaller Il-18 turboprop transport was temporarily grounded out of scheduled passenger service following a crash of one of the planes near Moscow. Premier Khrushchev and his delegation made their way to the United Nations meetings in September via ocean liner. The two airplanes, Tu-114 and Il-18, which had taken the Premier and his party to the United States in September 1959, were relegated to transatlantic courier service during the UN General Assembly meetings. The Russian airline, Aeroflot, operated its red-carpet service with the twin-turbojet Tu-104 and the four-turboprop An-10.

Meanwhile, the scheduled airlines of the West continued to expand their jet operations rapidly to provide a network of high-speed services over the international routes of the world. An estimated 100,000,000 passengers—as compared with 97,000,000 in 1959—flew on the world's scheduled airlines, not counting those of the People's Republic of China

DOUGLAS AIRCRAFT

Although the Douglas DC–8 jet-transport plane was introduced as recently as 1959, it has already proved its worth on a number of major airlines.

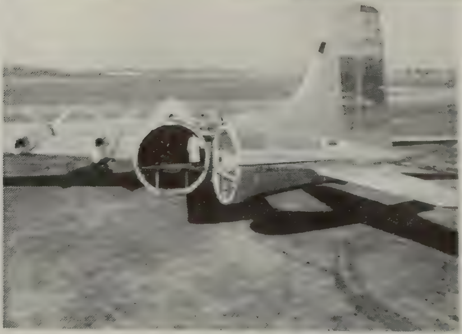
The two turbojet engines are mounted to the rear of the fuselage on the French Caravelle (left).

and the Soviet Union, on both international and domestic routes.

The only dark spot in the commercial aviation picture was the speed restriction placed on the Lockheed Electra turboprop transport, pending several modifications of the airplane by the manufacturer.

Three models of the Boeing turbojet transport were in regular service in 1960—the Boeing Intercontinental, the original Boeing 707 and the smaller Boeing 720. The Douglas DC-8, introduced in 1959, quickly became a familiar model in the skies, and the Convair 880 joined the competition on Delta Air Lines routes in the summer of 1960. The French-built Caravelle, unique because its two turbojet engines are mounted on the aft section of the fuselage rather than on the wings, was exceedingly popular on European routes. It is slated to serve the United States over United Air Lines routes in 1961. The de Havilland Comet, a four-turbojet transport built in England and the offspring of the world's first jet transport aircraft, was in widespread use by leading airlines on international routes.

The British Vickers Viscount, first of the turboprop transports, continued to serve many airlines throughout the world as a popular medium-range transport. The Bristol Britannia turboprop covered long-range routes. The Fokker Friendship, built in the Netherlands, and its United States counterpart—the Fairchild F-27—were in general use as commuter airplanes on a number of local-service or



CANADAIR

On the all-cargo, turboprop Canadair CL–44D–4 the entire tail section can be swung aside on hinges. This permits unusually easy and quick loading.

short-haul routes. Another turboprop plane, the Canadair CL-44, manufactured in Canada, was slated for delivery in 1961 to two American carriers as a swing-tail all-cargo airplane. Cargo loading and unloading will be expedited because the entire tail section can be swung to one side on hinges, permitting easy access to the main cargo hold.

Also ready for delivery in 1961 is the turbine-powered helicopter, the Sikorsky S-61, which will first see service on the metropolitan routes of Chicago Helicopter Airlines. In England, two turboprop transports designed for medium-range services—the Avro 748 and the Handley Page Herald—made their bid to enter the competition during the year. An all-cargo plane, the British-built turboprop Argosy, was sold to Riddle Airlines, an American company.

As the popularity of the airplane continues to increase, American air travel is making deep inroads in other fields of transportation. In 1950 the airlines handled only 14 per cent of all intercity, common-carrier passenger miles. But by 1959, this percentage had increased to 48, with the railroads accounting for 28 per cent and the intercity bus lines for 24 per cent of the total. This growth is due in great part to the fine safety record of the airlines which in 1959 showed that there were only 0.7 fatalities for each 100,000,000 passenger miles flown.

In the United States, in the military field, aviation began to show the impact of the increasing emphasis on missile defense. From its postwar peak of 411 combat squadrons and more than a million military personnel, the Air Force, by the middle of 1960, was forced to reduce its aircraft strength to 316 combat sections with 825,000 personnel. Aircraft inventory of the regular Air Force was reduced to 15,000 by the middle of the year, as compared to the postwar peak of 18,860 aircraft reached in 1956. Further reductions are expected during 1961. The only aircraft on order at the present time by the Air Force are the B-52H Stratofortress and the B-58 Hustler bombers, the F-105D Thunderchief fighter, two transports, three trainers and one helicopter—the H-43B Huskie.

The Strategic Air Command is currently getting only 14 of the heavy bomber B-52 wings it has requested and there is little chance that this force will be increased. A total of 704 B-52's have been on the program for the SAC 14-wing heavy bomber force. The SAC B-36 fleet has been completely retired and the B-47 bomber fleet underwent the first stages of progressive retirement in 1960. More B-47's will be retired as new B-52 wings are added and the supersonic B-58 bomber enters the picture. The Tactical Air Command is primarily equipped with F-100 fighter bombers and a few F-104's. The F-105 Mach 2 fighter bomber is now being gradually introduced into the TAC inventory. (The Mach number indicates the ratio of the plane's speed to the speed of sound in the atmosphere surrounding the plane.)

The Air Force shifted to an all-jet pilot-training program in 1960, using the twin jet T-37 for primary training and the supersonic T-38 as a replacement for the T-33 for advanced training.

The United States Navy was scheduled to order 658 new aircraft during 1960, a slight reduction from the 689 programed the previous year. As a result, the Navy has reduced the number of models it will buy from 16 to 12. Samples of the types that the Navy will purchase are the North American Aviation A3J-1, a supersonic high-altitude penetration weapons system; the McDonnell F4H Mach-2-plus all-weather fighter; Chance Vought F8U-2N fighter, with a speed approaching Mach 2; the Douglas A4D-2N and the Grumman W2F airborne early warning aircraft.

In the field of business flying, the number of private and utility aircraft sold from 1950 through 1959 more than doubled. Manufacturers of the small planes were saying in 1960 that during the next 10 years the small aircraft population of the United States will leap from the current 70,747 planes to more than 120,000. Total flying hours of this general aviation fleet are expected to climb to more than 20,000,000 annually, as compared to the present 12,400,000 hours.

SIKORSKY

The Sikorsky S–61, a transport helicopter, is equipped with twin gas-turbine engines and a flying-boat hull. An amphibious craft, it can take off and land on almost any surface. It can also sustain flight on a single engine.

CONSUMER CREDIT

By JOHN W. HAZARD

Senior Editor
CHANGING TIMES

ONE of the enigmas of our time is how Americans can go deeper and still deeper into debt. Year after year the debt burden rises and economists and sociologists wonder where it will end. Today consumer debt (short and intermediate, but not mortgage, debt) is the greatest in history. The total is nine times what it was after World War II and three times what it was ten years ago. And still the curve on the chart points upward. The over-all increase is due partly, of course, to the rise in population. Also, because today's dollar buys less than it used to, more money must be borrowed to finance purchase of a given amount of goods. But even when these factors are eliminated and consumer debt is put on a per capita basis in terms of constant dollars, the curve goes upward. After World War II, debt in terms of today's prices was only $70 per person. Today it is nearly $300.

This seemingly endless climb raises several questions. Who does most of the borrowing? What is the money used for? Where does it come from? Are borrowers as a whole going so far into debt that a recession would bring on a general default? And is an overextension of credit, nationwide, leading the economy toward a recession? The answers to these questions are somewhat, although not entirely, reassuring.

Consumer debt is not so widespread as might be supposed. Surveys by the Federal Reserve Board indicate that 60 per cent of all families are in debt to some extent, while 40 per cent are not in debt at all. It is interesting to note that many of the families that borrow money do not need to. Of those who have consumer debt, two thirds have some liquid assets while one third have liquid assets that actually exceed the amount owed. These families, it appears, would rather finance purchases by borrowing than to disturb savings that they might find it difficult to replace.

The great bulk of consumer borrowing is to finance the purchase of automobiles and household goods on the installment plan. Nearly two thirds of all automobiles are bought on time, as are three fourths of consumer durable goods. Of the $52,000,000,000 owed by American consumers at the end of 1959, three fourths was installment debt: the rest was charge accounts and single-payment loans.

Most of the borrowing is done by young middle-income families. For example, 70 per cent of families in the 25-to-34-year range have some installment debt. The peak also falls among families having incomes of from $6,000 to $7,500. In many cases the salary of a working wife brings a family income up to the level where the family feels that it can take on heavy installment obligations. The typical family does not go into debt when it is hard up but rather when it is prosperous. Debt rises when jobs are plentiful, incomes good, new homes are being built, and durable goods are selling well. In times of uncertainty, people hesitate to obligate themselves and the amount of debt levels off or dips.

In most years, however, the amount of money borrowed exceeds the amount repaid. In the past ten years, repayments exceeded borrowing only in 1958, and then by a mere $100,000,000. Recently the amount borrowed has run at 14½ per cent of disposable income while repayments have run at only 13 per cent. The result, of course, is that total debt has been mounting.

Contributing to the rise is the continual appearance of new gimmicks that permit the consumer to buy a greater variety of goods and services and to pay later. Among the latest wrinkles are revolving check credit, charge-account banking and the all-purpose credit card.

Revolving check credit is offered by more than two hundred banks. Once an applicant is approved for such credit—about one third of those who apply are turned down—he, or she, can sit down and write a check for hundreds, perhaps even thousands of dollars, without having a cent in the bank. In doing this, of course, the person is borrowing within a limit previously agreed upon. Here is an example, according to one bank's plan, of how this works. An account holder might have an approved line of credit, or limit, of $800. He could draw checks at any time without further consultation with the bank until he had reached his limit. Suppose he wrote a check for $300. The bank would honor the check and begin billing him at the rate of one twelfth of $300 each month, or $25, plus a charge of 1 per cent a month on the unpaid balance and 6 cents per $100 for credit life insurance. Even while repaying this loan the borrower could write other checks as long as his total did not exceed $800. Each month's repayment would be one twelfth of his outstanding debt.

Other banks offer plans with slightly different interest and repayment rates. Although revolving check credit may sound like a loose way of handing out money, the banks find that losses are about the same as in their other consumer lending operations—under 1 per cent.

Charge-account banking is a credit service whereby the retail shopper may establish his credit at the bank and by so doing automatically establish his credit at a number of associated retail stores. A bank may operate such a plan in connection with hundreds, or even thousands, of stores. Each customer who has been approved for credit receives a directory of the stores plus a credit card that permits purchases up to $25 to be charged automatically and larger ones to be charged on telephone approval by the bank. The bank bills customers by the month and charges the stores a percentage fee, commonly 6 per cent, for the service.

Credit cards are available for use with hotels, stores, restaurants, gas stations, car-rental services, airlines, railroads and so on. One southern bank even issues a credit card that is good for a cash loan; this service is known as "instant money." It is easily possible for a person with a folder of credit cards to live for months, spending thousands of dollars, without ever using cash at all.

From a sociological view this tremendous and growing use of credit has been questioned. Some families do tend to judge the cost of an article or service in terms of the monthly payment, disregarding both the total price and the cost of the credit. And the cost can be very heavy, particularly in periods, such as the early months of 1960, when interest rates were as high as at any time in twenty-five

A. DEVANEY, INC.

Many farmers buy equipment on time; this type of buying introduces some distortion into the economy.

INCREASE OF CONSUMER CREDIT IN THE UNITED STATES

YEAR	CREDIT OUTSTANDING AT END OF YEAR	CREDIT PER CAPITA	CONSUMER PRICES (1959=100)	CREDIT PER CAPITA IN 1959 PRICES
1945	$ 5,665,000,000	$ 43	62	$ 70
1946	8,384,000,000	59	67	88
1947	11,570,000,000	80	77	104
1948	14,411,000,000	98	83	119
1949	17,104,000,000	115	82	141
1950	20,813,000,000	137	83	166
1951	21,468,000,000	140	89	158
1952	25,827,000,000	166	91	183
1953	31,393,000,000	198	92	215
1954	32,464,000,000	202	92	220
1955	38,882,000,000	237	92	258
1956	42,511,000,000	254	94	272
1957	45,286,000,000	264	97	272
1958	45,586,000,000	264	99	266
1959	52,046,000,000	292	100	292

years. In an effort to acquaint borrowers with the cost of using credit, some states, such as New York, have passed legislation requiring the seller or lender to state clearly the amount and nature of every credit charge. One reason for such legislation is that the various lenders figure interest differently.

Banks generally make installment loans on a discount basis. Thus a borrower might obtain a loan of $500 for one year at 6 per cent discount. The bank would advance him $470 ($500 minus the 6 per cent) and the borrower would repay the full $500 in twelve monthly installments. Because he would have the use of $500 at the beginning of the period and nothing at the end, the average usable amount would be only $250. The simple interest figured on an annual basis would come to nearly double the discount rate or close to 12 per cent. A variation of the discount is the add-on. The borrower might obtain the full $500, but would repay $530. Rates charged by banks vary, depending on whether the loan is secured, what the rate of repayment is and so on. A loan secured by marketable securities might cost only 6 per cent on the unpaid balance. A 30-month automobile loan might cost 4 per cent discounted; a 36-month loan, 5 per cent discounted. On an unsecured personal loan a bank might charge as much as 7 per cent discounted although 6 per cent would be more common.

Consumer finance companies or small loan companies are patronized mostly by those who are burdened with heavy medical or hospital bills or who have various debts that they wish to consolidate. Because the borrower usually wants relatively small amounts, charges are higher than those of banks. The main reason for this is that there are certain minimum costs of putting a loan, large or small, on the books and getting it off—credit investigation, bookkeeping, overhead and so on. The Household Finance Company, for example, figures this basic cost at $17 per loan exclusive of interest.

Small loan-company charges generally are expressed as so much a month on the unpaid balance. In New York State, for example, small loan companies are permitted to charge 2½ per cent per month (30 per cent per year) on that portion of a loan up to $100; 2 per cent a month (24 per cent a year) on the portion from $100 to $300 and ½ of 1 per cent a month (6 per cent a year) on the portion from $300 to $500.

Buying goods on the installment plan from stores or dealers generally costs 1 per cent a month (12 per cent a year) to 1½ per cent a month (18 per cent a year). If you buy from an automobile dealer the chances are nine to one that the sales contract will be sold to a finance company. On the other hand, if you buy on time from a furniture, department or jewelry store the chances are that the store will keep the contract.

Credit unions lend to their own members, usually at the rate of 1 per cent a month (12 per cent a year), or in some cases as low as ¾ of 1 per cent a month (9 per cent a year).

Are American families overburdened with debt and thus vulnerable to a recession? Probably not. Amazingly enough, consumers as a whole apparently never have overborrowed. At least, no recession, or even depression, has ever caused widespread defaults. The First National City Bank of New York points out that over the past thirty-two years the bank has extended $5,000,000,000 of consumer credit. Yet losses have been less than ¼ of 1 per cent. Even during the great depression of the 1930's, losses never went above this rate. On $26,000,000 lent to consumers in 1934 the bank lost only $9,300, or 1/25 of 1 per cent. And there is no reason to believe that banks and most other lenders are less careful about their loans today than they have been in the past.

Of course when you borrow you do introduce some distortion into the economy. Instead of spending this month's income you are spending this month's and part of next month's, and perhaps part of next year's. This tends to give business a bulge. If you and others continue to use credit ever more and more freely this bulge could be maintained and even expanded. In 1959, for instance, total consumer credit increased by more than $7,000,000,000. Thus retail business got a $7,000,000,000 shot in the arm that it would not have received had everyone spent merely what he earned. Theoretically a year could come along when consumers not only did not increase their debt but decided to pay off more of it. This could cause a tremendous net drop in retail business.

The fear of a turnaround is as old as consumer credit itself. In 1925 the Kiplinger Washington Letter reported on "the propriety of this growing practice," stating that "there is fear that too many citizens are spending before they earn, that markets are being forced, and that reaction and collapse will occur." So far, of course, consumer credit has caused no widespread collapse, although Dr. Raymond J. Saulnier, chairman of President Eisenhower's Council of Economic Advisers, has described 1955 as a year in which merchants attempted to do two years' business in one. By doing so, he said, they helped to bring on the last recession.

As to the future it is likely that consumer debt will increase before it eventually levels off. Lenders will think of new services that can be provided on the installment plan. One probably will be college education. Also lying ahead is a rise in the number of middle-income families—those who use most installment credit. Over the next fifteen years the category of families now earning $3,000 to $8,000 will probably move up into the $5,000 to $12,000 bracket. There will also be an increase in the age group where people borrow most heavily. Today the big population bulge is among teen-agers. As time goes on this bulge will eventually cause larger increases in family formation, new home construction and heavy purchases (no doubt on the installment plan) of new cars, furniture and appliances.

Thus consumer credit will probably continue to rise and to occupy at least as important a place in the economy as it does today. And if borrowers are as faithful in repaying and lenders as cautious in extending credit, probably no great harm will result. But the chances are that observers will continue to wonder how long Americans can continue to go deeper and deeper into debt.

"THE NEW YORK TIMES"

BUSINESS AND FINANCE

CONVENTIONS ARE BIG GAME

By CHARLES PAUL MAY

ALMOST 25,000 conventions pour $4,000,000,000 a year into the coffers of the American cities where they meet. It is not surprising that every city in the United States and Canada is out to lure, woo and bag every such gathering possible. The more conventions a city can capture, the wealthier that community will be. So chambers of commerce and visitors' bureaus are lining up conventions for their cities for 1962, 1965 and even for 1975 if anyone wants to plan that far in advance (and some organizations do).

In 1959 New York City alone played host to 782 conventions, happily pocketing $222,900,000 along the way. Signs indicate that prospects are even brighter for the 1960's.

The cities that give New York the strongest competition are Chicago, Detroit, Philadelphia, San Francisco, Los Angeles, Montreal, Toronto, Cleveland, Washington, Miami Beach and Atlantic City. At the same time, Ottawa, Vancouver, Quebec City, Kansas City, the Denver area, Milwaukee, St. Louis and Dallas are giving the leaders a run for the convention money. Even Biloxi, Regina, Calgary, Cheyenne and the Augustas (Maine and Georgia) hope to entice small groups that they are equipped to handle. A convention city must offer good hotel and communications facilities, meeting places and entertainment.

The great conventions of 1960 were those at which Democratic and Republican candidates for the presidency of the United States were nominated. To corral one of these national political gatherings a city must have a meeting place large enough to hold about 18,000 people. This narrows the field to New York, Chicago, Philadelphia, San Francisco, Los Angeles, Miami Beach and Atlantic City. The only one of these in a location that is central for the entire nation is Chicago; both political parties met there in 1952, the Democrats returned in 1956 and the Republicans in 1960. Because the West is growing in political importance the Republicans met in San Francisco in 1956, and the Democrats in Los Angeles in 1960.

National political conventions are not big money-makers for cities, however.

For one thing, the city playing host must put up a purse of about $300,000 to cover the cost of television, press and other communications facilities. Hotels, restaurants and places of business that will reap the profits must make up this fund. For another thing, political conventioneers are dedicated people who are in town to take part in the proceedings. They are not so easily lured from the meeting halls as are other convention-goers and, even when sessions are not being held, members are busy trying to influence one another. They don't have the on-the-town spirit that makes for big spending.

So why did New York City take care to point out that it has the largest and finest communications facilities in the world? Why did Miami Beach promise to have a separate air-conditioned hotel available as headquarters for each state delegation? For one reason, because the political conventions are held during the heat of the summer when many cities have their fewest visitors. Hotels and other facilities are having a slack period, so if a city's headhunters can bag a big convention, it is a boon to the community. Collecting the purse is not a problem when 18,000 people are coming to town. No matter how little the delegates spend they will bring much more profit than the city would make otherwise. Besides, look at the publicity that visits from the Democrats and the Republicans brought to Chicago and Los Angeles in 1960. Other scouts looking for meeting sites cannot help being impressed: Mr. Convention Spotpicker for Streamlined Bricks may decide that if Chicago is good enough for a major political party, it is good enough for him.

To attract a convention a city must do more than send its best hunters out on a safari. It must dress up its assets so that the chamber of commerce will have tempting tidbits to sprinkle in the path of any group it wants to snare. New York City built its huge new Coliseum so that it could promise space for four conventions at the same time, each with its own entrance to keep conventioneers neatly separated. New York also wages a continuous campaign against litterbugs, partly from fear that an advance man for a convention might decide that the city is too dirty for his charges to visit. Chicago's International Amphitheater, where the 1960 Republican National Convention was held, is down at the Stockyards—an inconvenient and sometimes odorous location. For its new Exposition Hall the city planners chose a beautiful site on Lake Michigan, just ten minutes' taxi ride from the Loop.

Dallas has built a new Memorial Auditorium large enough for three conventions, of which one can be made up of more than 10,000 people. That city also makes available its famous 75,000-seat Cotton Bowl and 6,000 seats at the State Fair Band Shell.

All of the cities point out their fine entertainment possibilities, from theater, music, art and night clubs to museums, historic landmarks, sports and other outdoor activities. Each calls attention to its good points. Atlantic City, Tucson and Las Vegas ballyhoo their favorable weather; Montreal, Quebec City and New Orleans use the charm of their fascinating French atmosphere as a selling point.

If the men who have the say decide to convene the members of their organization at Edmonton or Omaha instead of Dead End, it may be because Dead End is dull. No city that has been labeled dull has much chance of attracting major meetings. Sometimes large manufacturing firms will set up exhibitions costing as much as $75,000 just to introduce a new product. They may take over an entire hotel and pay transportation costs to fly in buyers from every state for the showing. Their expense accounts may allow another $75,000 for entertaining those buyers. And poor old Dead End just doesn't have the night clubs, theaters and posh restaurants to fit into anything beyond the $5,000 entertainment picture.

On the other hand when a group agrees to demonstrate "togetherness" in Toronto or Chattanooga instead of New York City, it may be because New York is too lively. Certain convention planners want to be sure that members spend some time at the meetings, and if a city has too much to offer, it can become a distracting element. Not many cities have this handicap but New York does.

Especially sought after are meetings of such groups as the American Medical Association. Doctors usually make reasonably high incomes and they aren't afraid to spend money. What is more, since an active practice may not permit a doctor much time with his wife and children at home, he often takes his family along to conventions. Members of the group who bring their wives are more than welcome.

It has been computed that the convention-goer spends, on an average, about $32 a day, of which about $15 goes to hotels for room, meals and liquor. Department and other stores garner about $5, while restaurants account for about $4.75 per person. Bars rate something like $2.50, night clubs and sporting events $1.75, taxis and buses $1.25. An average of a little more than fifty cents a person goes to theaters, and sightseeing facilities get about thirty-five cents per person. The rest is scattered in small amounts, but with several thousand conventioneers in town the total adds up. Air lines, railroads, bus lines and filling stations benefit by nearly $1,000,000,000 annually as the delegates travel to and from the meeting cities.

A convention may be a meeting of 40 executives in the meat-packing industry or 25,000 members of a fraternal organization or service group such as Rotary International.

The convention business is international in scope, and cities of the West Indies and of Europe are competing actively in the race to attract convention dollars from all over the world. North American cities are doing the same; recently a group that had planned to meet in the United States went to Montreal instead because Canada's visa requirements made entry there easier for some of the members.

Whether a gathering calls itself a rally, a trade fair, a training session, a meeting or a reunion, it is still a convention to the city trying to bring it to town. And although there are seasons governing most hunters in tracking down their quarry, a group planning a convention is fair game for chambers of commerce and visitors' bureaus the year round.

Delegates of the New York State Medical Society meet in convention.

BUSINESS AND FINANCE

JAPAN-World Trader

By DOROTHY CAREW

JAPAN, an island nation that depends on foreign trade for survival, has built a modern industrial society on the ashes of her World War II defeat. Today she is once again an important factor in world trade. More than $3,000,000,000 worth of textiles, clothing, transistor radios, toys, machinery, foodstuffs, iron and steel products and other goods with "Made in Japan" labels were bought by countries throughout the world in 1959. At the same time, Japan imported more than $2,885,000,000 worth of raw materials and products.

Japan's industry, agriculture and national income have far surpassed the highest levels they attained before World War II. As recently as 1954 the United States Government was seriously concerned about Japan's economic plight, but today her expansion is proceeding in an orderly manner and she has become a creditor instead of a debtor nation.

A combination of several factors has made this development possible. The United States, both during the postwar occupation of Japan (1945–52) and since, has in various ways provided more than $6,000,000,000 of funds. The Korean War (1950–53) made it necessary to step up Japanese production. Greater freedom of trade and world-wide economic recovery opened new markets for her products. Japan has been included in international programs sponsored by the United States. Last but not least the Japanese people themselves contributed their skills, abilities and ambitions. Without these it would not have been possible to meet the challenge of rebuilding their economy on a modern competitive scale.

Japan is unique among free Asian countries in many ways. Her geographical situation is unusual. A nation of four main islands and many smaller ones, her total area is roughly that of California. With nearly 93,000,000 people, Japan has the fifth largest population in the world. Because her land is mountainous, only one acre in six can be cultivated. This means that at least 20 per cent of her food must be imported. Japan must produce more goods for export to support her growing population, but she lacks raw materials and must import them if she is to raise her production level. Her imports include all the rubber, wool, cotton and bauxite, most of the iron ore and salt, 90 per cent of the petroleum and a third of the coking coal needed for Japanese industry.

Economists have estimated that to continue a 6.5 per cent annual economic growth, which Japan has considered necessary in terms of her growing population, she would have to increase imports by 40 per cent over a period of five years. To pay for these, her exports would have to be boosted about 77 per cent.

With this need for a modern industrial economy, Japan has become the one Far Eastern country to move steadily toward Western ideas and technology. Her industry, based on Western science and know-how, is geared to produce quality products that can compete with those of other countries in world trade.

The success of Japan as the leading industrial nation of Asia is reflected in her accomplishments. She is the largest shipbuilder in the world and ranks third in production of cotton and rayon textiles. In the first half of 1959, Japan topped France to become the fifth nation in the world in iron and steel production. Her motion-picture industry is flourishing and, as automobile production continues to expand, Japan's Datsun and Toyopet are taking their places in the world's small-car market.

Other new, fast-growing industries are electronics, now third largest in Japan, and the production of cameras and optical goods. High-quality, moderately priced transistor radios were among the first Japanese electronics products to appear in quantity on the American market. By 1958 a total of 2,500,000 Japanese radios, of which 83 per cent were transistor type, were sold in the United States. Now several American firms are importing radio and television parts and other similar equipment from Japanese manufacturers.

Portable television sets from Japan were first sold in the United States late in 1960, and color sets are expected to be available for import early this year. Looking toward the American market, the Japanese television industry is working on sets which can be operated either on batteries or house current. These will be similar in operation to two makes now being produced in the United States.

In addition to rising exports, Japan has a growing tourist industry which is a source of substantial income. The Ministry of Transportation estimated in mid-1960 that 210,000 travelers would visit Japan during that year, providing revenue of about $110,000,000. This would be a 20 per cent increase over the 1959 total.

In Japan itself the standard of living is said to be 25 per cent higher than it was before World War II even though 20,000,000 more people live in less space than Japan had before the war. Almost every Japanese family owns a radio, one in four has television, electric appliance sales are soaring and more newspapers are sold per capita there than in the United States. The Japanese are the best clothed, best housed and best fed people in Asia, and economists say that current industrial growth is at a rate great enough to double the national income every ten years.

This does not mean that Japan's problems are over. Much modernization and expansion of Japanese industry are needed before the island nation can achieve her production potential. Japan must find markets through which she can increase the volume of her annual exports in relation to her output, and she also must have a large enough variety of exports and markets to offset the possible effects of special world situations.

The United States has a close relationship with Japan today. Not only have American technology and money helped to develop the Japanese postwar economy, but, next to Canada, Japan is currently the biggest single customer of the United States. The United States, in turn, buys more Japanese goods than does any other single country in the world. In 1959 the United States bought more than

Japanese-made automobiles play an important part in Japan's export picture. The Toyopet and Datsun are becoming increasingly popular in many countries.

CONSULATE GENERAL OF JAPAN N Y

$1,000,000,000 worth of Japanese goods, while Japan imported $935,000,000 of American raw materials and products. That year was the first since World War II in which Japan's exports to the United States were greater than her imports from that country.

Through 1959 various trade restrictions hampered the flow of American goods to Japan. These gradually have been removed or modified and a far broader market is opening in Japan for United States products.

"Japan, in my opinion, offers the greatest potential in the world for expansion of American exports," a United States Department of Commerce spokesman said. "The country is prosperous, dynamic, and of growing industrial importance. Japanese products are being sold in world markets in ever-increasing amounts, earning foreign exchange that can become available for purchase of many items that the Japanese economy and the Japanese people need and desire.

"It seems to me we shall be wise to continue to import from Japan some textiles, plywood, cameras, electronic devices and other products," he continued, "so that we in return may sell automobiles, business machines, cotton, coal and a host of other products to Japan. This can be the pattern of a two-way trade."

Japanese thinking seems to run along the same lines. Japan sees the United States as an ideal market for the products she is best equipped to make—products that require skilled workmanship but a minimum of raw materials. Looking toward the European Common Market and its possible effect on foreign traders, the Japanese are indulging in some wishful thinking. They envision, eventually, a common market of their own including the United States, Canada, Australia and Japan.

Both the United States and Japan are trying to gauge imports on the basis of market conditions. However, there has been concern that Japanese textiles and clothing, which accounted for more than 25 per cent of all United States imports from Japan in 1959, may harm those American industries. Cotton textile men say that the Japanese can produce textiles with American cotton at a lower price than is possible in the United States because of low labor costs and the fact that Japanese manufacturers do not come under the American domestic support program for cotton. The Amalgamated Clothing Workers Union voted in mid-year to fight import of men's suits from Japan and other low-wage countries after Japan announced that it planned to export 120,000 suits to the United States in 1960. Earlier a voluntary limitation of 25,000 to 30,000 suits had been discussed.

In many fields businessmen and companies are investing in Japanese firms. At the same time American trade missions are studying Japanese facilities and procedures and are making recommendations in terms of the American market.

Japan also is reaching beyond her own borders both in terms of investment and technical assistance. She is taking part in international assistance programs of the UN and is working closely with the American International Cooperation Administration (ICA) in its development plans in Asia. On her own, Japan has given technical aid in the building of a modern water-supply system for Vientiane, the capital of Laos, has sent fishery experts to Malaya and Ceylon, and is conducting a Tokyo nuclear-science training program for southeast Asia.

The interest of the United States and other Western powers in the fate of Japan springs not only from the fact that she offers a market for exports. Economically Japan holds the balance of power in the Far East. She is the biggest industrial power in the Orient, and the Western powers want her on their side. If Japan turned toward Russia or decided to take a neutral stand, the American military position in Asia would be less secure. An even more important factor—if for any reason Japan repudiated democracy, other peoples in the world might see this as an indication that Western-style democracy is not suited to the Far East.

BUSINESS AND FINANCE

FINDING THE RIGHT MAN

By JOSEPH S. ROSAPEPE

Business and Financial Writer

AMERICAN industry has grown enormously in recent years—in sales, earnings, production, personnel and investment. With the increased demand for men, money and materials, industry has been feeling the need for more topnotch executives. Such men are needed to direct and manage the large corporations that have grown up from small companies as well as the many organizations formed in new fields. Growth within the past two decades—in electronics, nucleonics, astronautics, synthetic fibers, plastics and air conditioning—has contributed to this need. So has the expansion of services related to industry, such as public relations, data processing, management planning, pension administration and so on.

Under normal conditions, executives are for the most part developed inside each company and promotions to middle and top management positions are made from within. This policy, long advocated by personnel experts, offers incentive to younger men in a firm; it also provides a company with executives who are already familiar with the organization. Difficulties arise, however, when a company, for one reason or another, does not have a reservoir of executives or when it needs new blood to meet competition. Sometimes a company grows too rapidly to develop enough executives for its needs, or it may branch out into a new field that calls for specialized leadership. But, whether the need be for a president, a vice-president or a man to head up marketing, sales, finance, production, engineering or research, the problem of finding the right man is often formidable. This problem has brought about the development of a new profession—that of executive recruiter.

Most companies maintain personnel- and employee-relations departments. It is the job of these departments to recruit and hire the vast numbers of clerical and technical workers needed, as well as the young college graduates who may eventually develop into executives. But personnel departments are rarely in a position to find, evaluate and hire department heads or executives in the higher echelons.

Industry has always been faced with something of a problem in finding an adequate supply of experienced executives. Hence the familiar saying, "There's always room at the top." Back at the turn of the century, companies looking for new executives generally turned to their banks. They realized that the banker knew about people in other companies—about their characters, reputations and backgrounds—and could possibly recommend suitable men. They consulted their legal advisers and their accounting firms, with the same idea in mind. Bankers, lawyers and accountants might not only know of possible candidates in other local organizations but they might also hear of competent executives in other cities who were seeking a change.

After World War I forward-looking companies called in efficiency experts to advise them on problems arising in connection with the tremendous industrial expansion then going on. They looked to those new industrial specialists—forerunners of today's management consultants—to help them find executives when none were available within their own organizations. By World War II the demands of the military services and government agencies, with those of industry, strained the reservoirs of executive manpower to an unprecedented degree. Postwar industrial reconversion and expansion brought an even greater need for management personnel. Executive re-

cruiting became really established as a profession.

There were already pioneers in the field. Some management consulting firms had set up special divisions to conduct "executive search." A few consultants specializing in executive recruiting as a separate profession had become established in the 1930's. Although their main offices were in New York, their clients were companies in all parts of the United States. As manufacturing firms found that the limited circle of their personal friends, bankers and lawyers could not meet their expanding needs for new executives, they turned more and more to professional recruiters. Today there are about seventy-five recruiting firms, composed principally of men who were formerly members of management consulting firms or who were personnel directors of corporations.

Many businessmen still confuse executive recruiting firms with employment agencies. There is a sharp difference between them. Employment agencies work primarily for persons looking for jobs and they collect fees from the applicants if they succeed in placing them. Executive recruiters, on the other hand, are retained by management to seek the right man for a company's needs and they are paid only by the company. Reputable recruiting firms expect to be paid for their professional services in conducting a search for an executive, whether they succeed in finding a man or not. According to best available reports, however, they do succeed in finding the right man in 85 per cent of the cases they work on. Generally it takes eight to ten weeks, but sometimes the search for a highly specialized executive may extend over a year or eighteen months.

The growth of the profession was recognized late in 1959 when leading firms in New York, Chicago and Los Angeles formed the Association of Executive Recruiting Consultants. The organization was formed to develop, maintain and enforce high standards of ethical professional practice among member firms. In general this group concentrates on finding executives in the $15,000- to $150,000-a-year salary range.

This is the way recruiters work. When a company has engaged his firm, the recruiter visits the company and sits down with management to define exactly the job in question and the type of man needed. The recruiter then makes a study of the industry files and begins an extensive search in the field through personal contact, by telephone and letter. Promising leads are followed up and screened. Prospective executives, and often their wives, are interviewed, references are checked and finally two or three candidates are referred to the client company which, of course, makes the final selection.

Executives seeking jobs often expect executive recruiters to help them in finding those jobs. But recruiters, who work at filling specific assignments, say that 95 per cent of the time they have to seek out the right person from among those already employed. Presidents of companies can often be found among heads of smaller firms who have the broad administrative experience needed by a larger company. Candidates are also found among the vice-presidents of an organization, only one of whom can succeed to the presidency. Recruiters often, by dint of hard work, unearth possible department heads from groups of assistants within a company.

The types of executives needed vary according to business cycles and the state of growth of an individual firm. During a period of expansion when mergers and financing are most important, executives with financial and legal background are in demand. When new lines of products and production methods are crucial, engineering and production talent is wanted. The need is for marketing and sales experts when competitive pressures are great. With rapid advances in new technologies, research and development men—especially those with administrative ability—are sought.

At one time recruiters were resented by some companies who lost executives to other firms. But today cries of "raiding" and "piracy" are rarely heard, since most large and medium-sized firms have turned to professional recruiters for aid. Among these firms, according to published reports, are General Electric, Westinghouse, Armour, Sears Roebuck, Cerro de Pasco, American Safety Razor, National Biscuit, New York Stock Exchange, Continental Can, Celanese, American Motors, Columbia Broadcasting System, Republic Steel, Radio Corporation of America, Chrysler and many others. An industry survey showed that, of firms queried, the number using executive recruiters rose from 28.9 per cent in 1959 to 37.2 per cent in 1960.

The outlook for this new professional service is highly promising. A 1960 report by the American Management Association said that during the next two years 64 per cent of firms surveyed expect to need executives from the outside, and another 35 per cent say there is a fifty-fifty chance that they may possibly have to seek executives from outside their organizations.

INDUSTRY

EXPLOSIVES UP-TO-DATE

By EDMUND GREKULINSKI

MUCH recent progress in conventional explosives and their use has been more or less obscured by spectacular gains in nuclear blasting. Gains in the usual types of explosives, however, are perhaps of equal importance.

In the conventional field there is a decided trend toward the greater use of chemical agents in demolition, mining, quarrying and so on. Massive charges of high explosives, rivaling small A-bombs in destructive power, can now move a hundred times their weight in rock and soil. Although great advances have been made in the power of concentrated explosives, they are much safer to handle than they were formerly. New techniques have also been devised for placing charges so that maximum destructive effects can be obtained with a minimum of explosives. Despite the tremendous forces unleashed in today's blasts, experts have learned how to keep damage to nearby structures at a minimum.

Again, perhaps this impressive use of big blasting power overshadows advances in the use of weaker and smaller charges. There is a fundamental distinction between high explosives, such as nitroglycerin (used in dynamite), and the far milder blasting agents, such as ammonium nitrate (a compound of nitrogen, hydrogen and oxygen), or low explosives such as black powder (gunpowder). High explosives detonate because of very rapid chemical reactions that produce great heat and, usually, immense gas pressures that shatter nearby objects in a fraction of a second. Dynamite will explode even in air, whereas gunpowder will not, although it burns rapidly. A low explosive, then, is much slower and weaker than a high explosive. There is no hard and fast line between the action of a low explosive (gunpowder) and that of a quickly burning fuel, such as those used in today's rocket engines.

High explosives, especially nitroglycerin, are mixed with slower ones, such as ammonium nitrate, to form dynamites of intermediate power and increased stability. Those with a high proportion of ammonium nitrate are very safe, or permissible. Their use is allowed in gaseous coal mines, where more powerful and sensitive dynamites are too dangerous.

About two hundred explosive compounds and mixtures are in commercial use today. Some of the newer ones are so insensitive that they cannot be set off even by a bullet or by flames. How, then, are they fired? An auxiliary charge, or primer, of more sensitive explosive is first ignited against the main charge. The primer itself is set off by a detonator containing an explosive. Fuse and detonator are started by flame or electric spark. Therefore, the blast goes off in three stages. More sensitive dynamites are exploded directly, by detonator or blasting cap.

The low-temperature explosives of today find their greatest use in many quarrying and mining operations, especially in coal mines where high temperatures, dust and inflammable gases pose a constant hazard. Ammonium nitrate is often mixed with a small quantity of diesel oil to make a charge that is stored and used in plastic containers that protect the charge from water. Such charges are useful in mines and elsewhere, because they can be set off in wet holes. Ammonium-nitrate explosives are often only about half as powerful as dynamite. Their use may require more extensive equipment, but they are less expensive. An ammonium-nitrate charge is often mixed at the scene of operations. In powdered form it can be fed into the charge holes by pneumatic blowing machines. Miners may vary the formula to attain the needed results. One powerful agent is TNT, ammonium nitrate and water mixed together. Other insensitive explosives based upon ammonium nitrate are the nitro-carbo-nitrates, such as Du Pont's Nitramite, which are being used increasingly. In coal mines, a relatively new kind of permissible is a combination of an improved carbon and liquid oxygen. The oxygen burns the carbon quickly, causing a powerful but safe blast.

Stable blasting agents are used wherever safety is more important than explosive force. In seismic prospecting, for example, explosives are used to cause rock vibrations that are measured for the purpose of locating oil deposits. The explosives are loaded into metal cylinders or paper tubes of varying lengths, which are lowered into holes bored in the ground or suspended in bodies of water and then are set off at specified depths. Explosives are also used to shoot oil wells, to insure or increase the flow of petroleum by breaking up the casing and the bedrock in the hole. The charges are lowered down the wells in metal containers and then exploded.

Much progress has been made in blasting techniques. In Sweden, the new Janol method is being applied to the mining of low-grade uranium ores. In principle, this method is simple. In driving a tunnel, or mine gallery, it is customary to drill charge holes for explosives into the face, or dead end, of the tunnel at right angles to its surface and parallel to the line of progress. This method is not very efficient because the explosive power is not all used in removing rock. In the Janol method, the working face is blasted with charges placed inside and parallel to the surface of the face and at right angles to the line of advance. Smaller charges are utilized more effectively in this process. Passages parallel to the main gallery are excavated. From these secondary galleries, drilling machines can drive shot holes into the adjoining working face of the adjacent main tunnel.

A. DEVANEY INC.

A coal miner inserts dynamite into a charge hole in the working face of a coal seam. When an electric spark sets off the blast, the great pressure released by the explosion breaks the coal into small pieces.

These holes are then charged with explosives from the side passages. The only possible drawback is the extra long charge, or shot, holes needed. A tunnel can even be extended from above ground by this method. By varying the depth, height, diameter, spacing and angles of the shot holes, an engineer can blast out a tunnel of almost any size and shape desired.

Charges may be shaped to make holes of various kinds. Shaped charges saw their first application on a wide scale in World War II, particularly in connection with antitank weapons. The explosive material is molded into a specific shape for the performance of a given task—to shatter rock or metal, to make a dent in these substances or to drill a deep, narrow hole. A shaped charge is encased in a container of almost any material, even paper. If it is flat at the end that is applied to the object to be blasted, it will shatter or dent the object, depending on the strength of the charge. Should the charge be molded so that it contains a cone-shaped cavity at its "business" end, it will make a shallow crater in an object when it is set off. To make a deep, narrow hole the charge cavity is lined with something like glass, metal or even clay. When the charge is exploded, this liner is smashed into tiny particles that form a thin jet moving forward at very high speed. The jet bores a hole in rock or metal just about as effectively as any high-speed steel drill, and in a fraction of a second. Successive lined charges may be set off to deepen the hole if necessary. This method of drilling or, rather, punching is very inexpensive since the container and liner may be made of almost any solid material that is at hand.

Shaped charges are especially useful on farms, for blasting stumps and postholes, in mines and in newly explored regions with few mechanical facilities. They are also employed in tapping openhearth furnaces in steel mills and in shooting oil wells. The New Mexico Institute of Mining and Technology at Socorro is experimenting with shaped charges in an attempt to extend their peacetime uses, particularly in mining.

The use of explosives is not confined to mining, quarrying, construction and military operations. Today they are being used in hardening, boring, cutting and even welding metal parts. Flexible explosive material is coated on the metal part, in the pattern to which the metal is to be cut. This material is then set off and the metal breaks along the line of the explosive, which is actually being used as a special kind of shaped charge. Flexible sheet explosives are also coated on metal parts and exploded to harden the metal by the sudden shock.

Progress has been made in detonators, fusing and blasting caps. Cheaper and safer explosives are being used to set off the main charge. Millisecond, or split-second, delay caps modify the kind of explosion produced. These caps reduce vibration and unwanted damage and increase the breakup of the material being demolished. Experiments carried on in Switzerland have shed light on the detonation of certain extremely sensitive, unstable explosives by radiation from brief electronic flashes. The effect seems to occur because the heat accompanying the light of these flashes, or sparks, raises the temperature of the chemicals above their critical points. The higher the temperature needed for detonation of these explosives, the greater the energy released by the sudden decomposition of these chemicals. The Swiss experiments may solve problems concerning the safe handling of sensitive explosives.

Under the United States Project Plowshare, peaceful uses for nuclear blasts have been tested experimentally. In the past few years, a number of underground atomic explosions have been set off. Atomic explosives are potentially cheaper than conventional ones. Only small quantities will be needed and the energy released, with one blast, will be sufficient to excavate harbors, basins and mines, to release oil from rock, divert rivers and underground drainage and to perform other useful work in a very short time. Months and even years of preparation and labor may be saved in this way.

Miniature GIANTS

By BRYAN BUNCH

WE are living in the midst of still another industrial revolution—in an era when we are learning to make small things smaller. Today the world's smallest incandescent lamp is so tiny that it can pass through the eye of a needle. A recently perfected hydraulic pump can be easily held between the thumb and forefinger. The lamp, the pump and thousands of other devices are miniature, and the process by which scientists and engineers are creating them is known as miniaturization.

Much of the recent progress in this field stems directly from the need to reduce the bulk and weight of components and instruments in space vehicles. There is a definite limit to the amount of equipment that any given rocket can lift into orbit around the earth or carry out into space toward the sun or farther stars. American scientists, naturally, in their desire to learn more about outer space, must introduce into their satellites as many types of recording and transmitting instruments as possible. On the other hand, the Soviet Union has rocket engines of greater power than the American ones and, therefore, Soviet scientists have not been forced to concentrate so intensively on achieving small, light instrument packages. As a result, it is believed that the United States is possibly twenty-five years ahead of the Soviet Union in this field.

Miniaturization seems to be the best way to provide lighter-weight, cheaper, more efficient and longer-lasting electronic parts. In general these tiny giants use less power, wear for years and, in many cases, are nearly unbreakable as well. Their size makes possible many new adaptations of radio, tape recording, computers and so on.

American engineers have worked for many years to make machines and devices smaller, but miniaturization as we know it today began less than fifteen years ago. In 1948, Bell Telephone was seeking a device to replace the bulky, fragile, inefficient vacuum tube that had become all-important to modern industry. As an

A tiny hydraulic pump which can be held between the thumb and forefinger provides greatly amplified energy for automobile controls—window lifts, transmission controls, windshield-wiper motors and so on.

ELECTRIC AUTOLITE CO.

The smallest-known incandescent lamp ever mass-produced can easily be passed through the eye of a needle. It is expected that lamps of this variety will open up many possibilities in miniaturization.

SCIENCE SERVICE

answer to their problem, the company's engineers developed the transistor, which is revolutionizing many aspects of both science and industry.

Transistors are of various types; whatever the type, they are used (as are vacuum tubes) for amplification, to change alternating current to direct current and to control wave lengths and frequencies. In fact they can perform almost all the tasks accomplished by the conventional vacuum tube and can even do a few things that vacuum tubes cannot. Because the transistor is more efficient, more durable and more rapid, Bell Telephone's midget substitute has become so popular that $222,000,000 worth of transistors were sold in 1959 alone.

There has been much progress in miniaturization since 1948. Not only has the transistor been improved and many new varieties developed for special application, but other small amplifiers have been invented. The Nuvistor (Radio Corporation of America) is a midget vacuum tube —no bigger than a thimble—that outperforms both transistors and normal-sized tubes in many low-voltage applications. The tunnel diode, another recent invention, is even faster, smaller and more resistant to heat and radiation than is the transistor.

In the United States program for miniaturizing equipment for space, much work has been done on the cores for filters used in relaying messages from outer space to the earth. Twenty-three of these cores are required for one relay system. When they were first used each core weighed four and a quarter pounds. Today's cores weigh only one third of an ounce, a reduction in weight of more than two hundred times.

Even a core weighing one third of an ounce, however, seems gigantic when compared to some of the minute devices developed for use in space vehicles. The bead thermister, for example, is only one hundredth of an inch in diameter, and yet it performs the function of a sensitive thermometer. It can measure temperatures from 572° F. above zero to 76° F. below. Another recently developed device is a radiation detector the size of a pinhead. It operates on the same general principle as the transistor and is inexpensive, stable and highly sensitive. In addition it requires almost no power, instead of the high voltages needed by previous radiation detectors.

These tiny measuring tools have down-to-earth medical applications as well as important uses in space research. The bead thermister is actually small enough to be placed in the end of a hypodermic needle so that it can record a patient's reaction while he is receiving treatment. Doctors will be able to insert the new radiation detector into various parts of the body. Its chief use will be in cancer treatment, to check the amount of radiation the malignant tissue receives from a nuclear reactor.

Undoubtedly the major gain in miniaturization has been the development of molecular electronics. In this new field, electronic systems are being produced which are as much as one thousand times smaller than the ones that came before. Westinghouse Electric Corporation and the United States Air Force jointly pioneered both the theory and practice of molecular electronics. The fundamental idea is to build the various functions of an entire electronics system into one solid block of semiconducting material. Engineers can tailor the different areas in the block so that one area may amplify a weak signal, another act as a resistor or condenser or perform some other function usually handled by a separate piece of equipment.

There is no name that is universally agreed upon for the new systems being developed in molecular electronics. Two possibilities have been suggested—"moletrons" and "FEBS" (for functional electronic blocks). Whatever one calls them, the new "mighty mites" are extremely impressive. A hi-fi set, for instance, has been displayed in which the preamplifier is about the size of a match head. Without miniaturization the preamplifier occupies about the same space as does a table radio. In the same hi-fi rig, the power amplifier has about the same shape as a dime and is somewhat smaller. Dr. S. W. Herwald, Westinghouse vice-president in charge of research, has commented, "If this can be accomplished now, it isn't difficult to foresee development of a complete communications receiver the size of a pea within a few years."

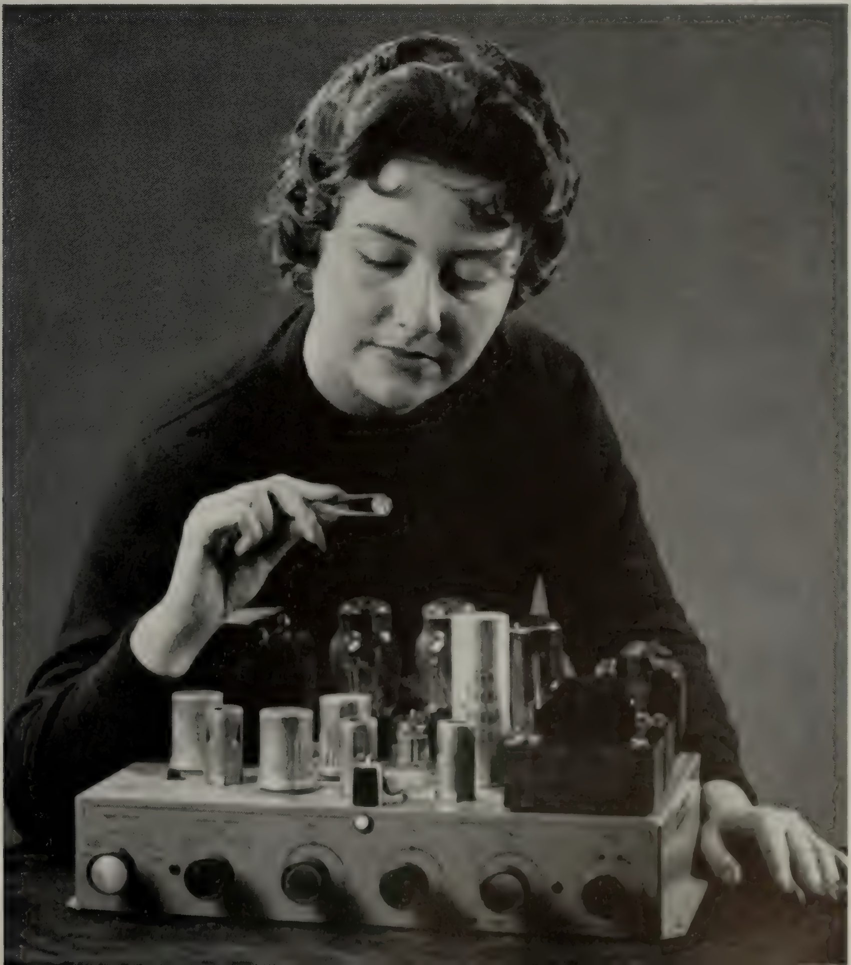
The techniques of miniaturization have made it possible to utilize very little power to obtain big effects. Generally speaking, the smaller the device, the more efficient it is. For instance, a certain power unit, operating with subminiature vacuum tubes, requires a power input of five watts. It has been calculated that the same unit, equipped with transistors, would require only about one watt. But one constructed by molecular-electronics techniques would need only 60 milliwatts, or .06 watts, of power to perform the same function.

Not all miniaturized products are electronic, although advances in electronics have been the most spectacular. One of the most useful tiny mechanical devices is the hydraulic pump referred to at the beginning of this article. It is about the size of an adult's little finger, but it is currently being used in machine tools, trucks and aircraft. It will be useful also in providing energy amplification for power steering, power windows, push-button transmission controls, fuel pumps and so on in automobiles.

In general, miniaturization will become more important as time goes on. It is impossible to foresee now the new developments that will come in the future. We are sure, however, of one thing—when man himself enters the world of space, almost incredibly light-weight and miniature equipment must be ready to travel with him.

The tiny round object that the model is holding with the tweezers is an amplifier that performs the same work as the conventional one on the table.

WESTINGHOUSE



CANADA BOOSTS GAS EXPORTS

By TANIA LONG

Correspondent in Canada
New York Times

THE gas and oil industry, already Canada's fastest-growing business, was given a tremendous boost in April 1960. The Government agreed to a large-scale export of natural gas to fuel-hungry markets of the United States.

The decision by the Conservative Government of Prime Minister John Diefenbaker to allow the exports came after years of delays, hesitation, jurisdictional dispute and national considerations on both sides of the border. It was generally welcomed in both Canada and the United States as a boon to industrial development and was expected to add about $100,000,000 annually to Canada's national coffers. This, in itself, is of special importance to a country which has had a consistently adverse balance of trade with the United States. The sale of gas to the Midwest and California will help to balance this trade deficit estimated at $600,000,000 a year. Furthermore, the exports of natural gas will help to offset the loss to the Canadian economy following the expiration in 1962 of current uranium contracts with the United States.

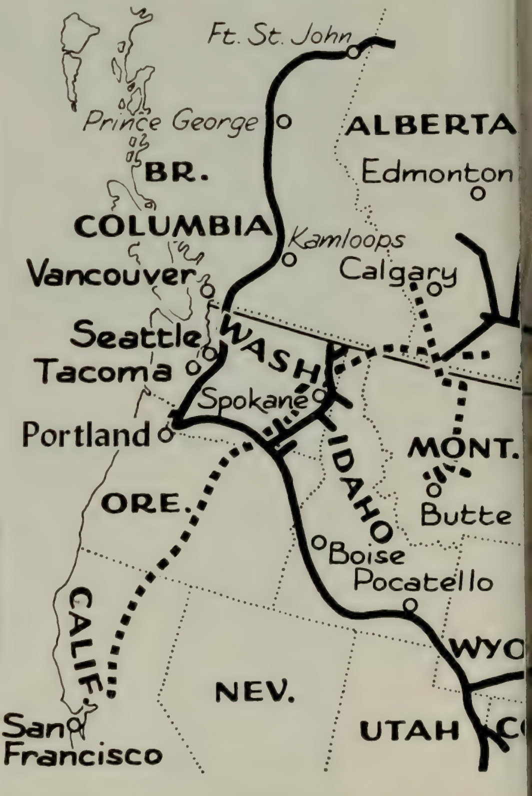
Applications of four Canadian companies to sell gas to the United States Northwest, Midwest and East were approved. The Alberta and Southern Gas Company, Ltd., was granted permission to move 458,750,000 cubic feet daily for 25 years from Alberta, via Kingsgate, British Columbia, to northern and central California. The Westcoast Transmission Company, Ltd., was empowered to move 152,000,000 cubic feet daily into eastern Washington for 20 years; the Canadian-Montana Pipe Line Company, to export 36,000,000 cubic feet a day into Montana for 25 years.

The Trans-Canada Pipe Lines Ltd., which already operates a booming pipeline system into central and eastern Canada, received permission to export 204,000,000 cubic feet daily for 20 years to North Dakota, Minnesota, Wisconsin and Michigan via Emerson, Manitoba; and, on an interrupted basis as conditions require, 204,000,000 cubic feet daily into northern New York and the eastern states via Niagara Falls, Ontario.

Biggest among the new projects was a 1,400-mile, $3,385,000,000 Alberta-California pipeline of Alberta and Southern and its affiliate the Alberta Natural Gas Company.

As soon as it received the go-ahead, Trans-Canada also began construction of a fifty-mile lateral pipeline connecting the main line near Winnipeg with Emerson. Altogether, a three-year capital investment program of $162,000,000 was initiated.

In 1959 the Canadian Government had appointed a National Energy Board to study the country's major fuel re-



THE NEW YORK TIMES

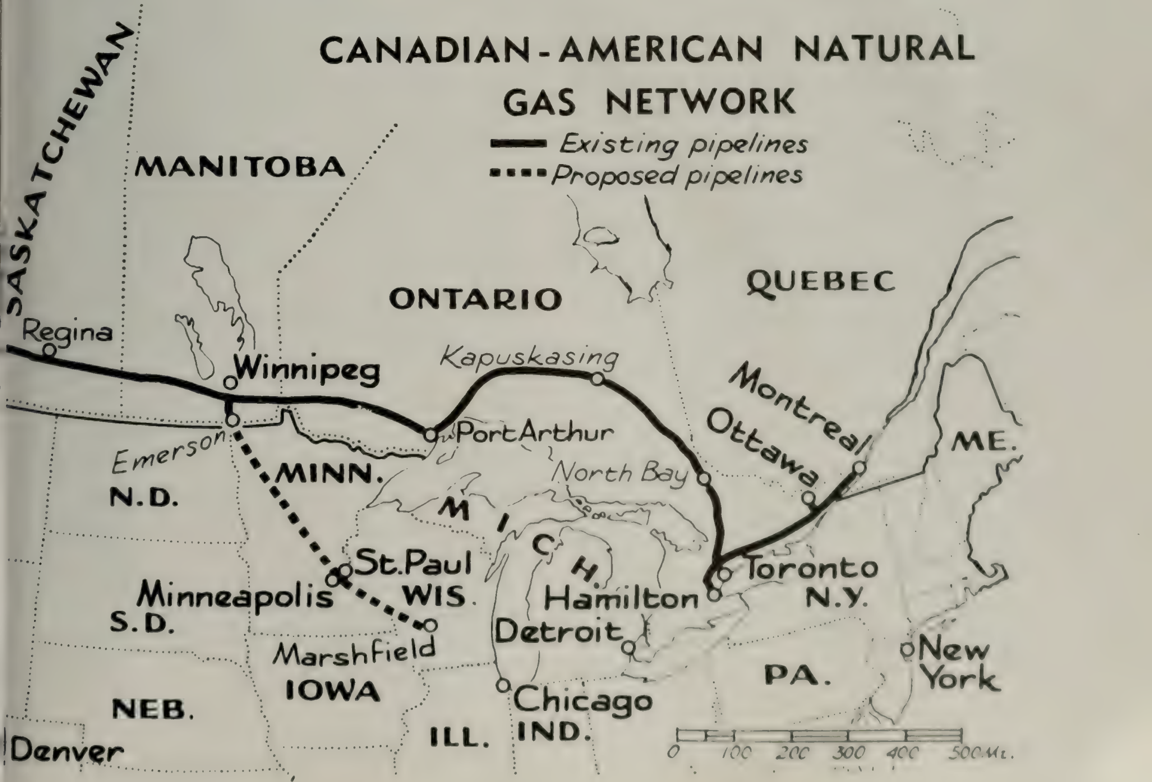
sources. This board recommended the natural-gas export program which, it said, would immediately result in an estimated $200,000,000 worth of capital investment in gas-transmission facilities alone. The board also foresaw additional investment in gathering facilities and processing plants. This meant, among other things, vastly expanded employment, an accelerated system of exploration for further resources and a generally improved industrial climate in the provinces involved in the export program. It was recognized that industry in the United States, too, would benefit in a variety of ways.

Besides the advantages to Canada stemming directly from natural-gas export, the expansion of her gas industry is resulting in production of several by-products of crude-gas processing. Some experts have estimated that by-products would add another $800,000,000 in revenue to the industry over the twenty-five-year period covered by the export licenses. Among these by-products are vast quantities of butane, propane, natural gasoline and condensate, and sulfur. It is expected that markets will be easily developed both in Canada and in the United States.

The plans for exporting Canadian gas to the United States were long in maturing. Ever since it became evident that the natural-gas reserves of western Canada were substantial, Canadian companies have been working out schemes for export and petitioning the various authorities for permission to go ahead. Such projects require permission from the provincial authorities for the removal of the gas from within provincial territories. Permits must be obtained from the Canadian Government for gas export from Canada and from the United States Federal Power Commission for its entry into the United States.

The whole question became somewhat involved because politicians took up the issue and argued for and against gas export on various grounds. Canadian authorities took the view that exports should be permitted only after reasonable provision for a long-term domestic demand. For some time, no one knew just how great the resources were or how big a demand there might be in Canada.

In the United States the Federal Power


CANADIAN-AMERICAN NATURAL GAS NETWORK

Commission delayed issuance of permits to the importing companies for a long time. It contended that no region in the United States should become solely dependent on gas from a foreign source which might be cut off either in a time of emergency or as a result of a shortage abroad.

Actually, a trickle of Canadian gas into the United States had begun in 1952 during the Korean War, when the gas-rich fields of Alberta sold gas to the Montana Power Company's network for industry in that state. To this was added, in late 1957, the much larger flow from the Peace River district of British Columbia to the Pacific Northwest. Westcoast Transmission Company, Ltd., was granted a permit to export 125,000,000,000 cubic feet annually to the Pacific-Northwest Pipeline Corporation in the United States for 25 years.

By 1958 Canadian natural-gas exports totaled 90,000,000,000 cubic feet annually, valued at $18,000,000. Since the freeing by the Canadian Government of trillions of cubic feet of natural gas over the next 25 years, however, exports are expected to rise to about 365,000,000,000 cubic feet annually, with earnings of $75,000,000. The expansion in the natural-gas industry is also expected to add at least another $25,000,000 to the national economy from plant investment, employment and other developments.

Can Canada actually maintain this anticipated supply? The National Energy Board, after lengthy hearings, estimated the country's known natural-gas reserves at 30,300,000,000,000 cubic feet. These reserves are almost enough to supply total requirements of the next three decades, which are expected to run to about 40,000,000,000,000 cubic feet.

However, as the Board reported to the Government, "Assuming that there will be an incentive to exploration sufficient to result in the drilling of some 360 to 400 wildcat wells per year, the Board believes that the development of further established reserves can be expected to reach an average rate of some 2,500,000,000,000 cubic feet per annum for at least the next ten years, and thereafter on a somewhat decreasing scale."

Industry leaders were certain that the granting of export licenses would provide incentive for further exploration.

Now that the industry has been given the green light, work is rapidly going forward on the new pipelines and processing plants with a view to a full flow of natural gas to United States markets in 1963. Industry is also taking a long look ahead.

Exploration for more natural-gas fields is the next step. The favorable exploration area for oil and gas in the Canadian West covers thousands of square miles. It stretches from a base 800 miles wide along the United States border to a northern boundary approximately 400 miles wide along the Arctic. Much of this is rough, almost impassable territory accessible only by bush planes landing on lakes, or by helicopter. Not only men and machines but supplies must be flown up at great cost and with some danger. The annual working period is greatly reduced by winds and snows. These factors add to the cost of exploration. The outlook for a growing demand for natural gas, however, is so good that all this is considered worthwhile economically.

A quick look at developments in the United States is of interest. Since 1920, natural gas marketed there has increased by an average of 7 per cent annually; since World War II the rate has been about 9 per cent. In 1920, gas accounted for only 4 per cent of total energy consumed, but by 1958 this had increased to 27 per cent.

In Canada, where the gas industry is still young and accounts for only about 10 per cent of total energy used, it has been harder to assess future requirements. Nevertheless, the Royal Commission for Canada's Economic Prospects forecast in 1957 that by 1980 natural gas might account for 22 per cent of total energy requirements.

In the meantime, the industry is planning to spend close to $7,000,000,000 on oil and gas development in Canada over the next ten years.

SAFETY on the HIGHWAYS

NATIONAL SAFETY COUNCIL

By HOWARD PYLE

President

National Safety Council

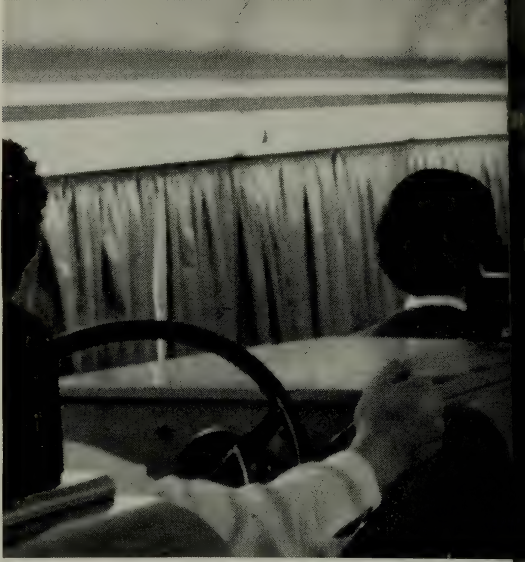
Safety can be built into the automobile—in the form of seat belts that will keep the driver and passengers from flying through the front windows or through the roof. Wrap-around windows to improve the driver's range of vision, and padded dashboards, also provide "built-in" safety; but the best accident-prevention device that can be installed in any car is a courteous, careful, well-trained driver.

A YOUNG woman was driving her car on a high-speed superhighway near a large Midwestern city when a passing truck splashed the car windshield, obscuring her vision. She stopped to clean the windshield and another driver stopped to help. A third automobile hit the two stationary ones. A fourth car that came upon the accident scene had virtually stopped when it was rammed by car number five. Eight persons were injured in this accident and one person—the young woman—was killed. Accidents of this type are occurring more and more frequently.

In 1959, 37,800 Americans lost their lives in traffic accidents and 1,400,000 people suffered injuries serious enough to disable them for longer than the day of the accident. Nearly three out of four traffic deaths occur in places classified by the National Safety Council as rural. Traffic deaths falling in the rural category include those occurring in towns with populations of less than 2,500 and on expressways in rural areas. The rural death toll in 1959 was 27,800, as compared with 10,000 urban deaths.

While expressways have proved to be much safer than other roads, a higher-than-average proportion of the accidents that do occur are rear-end collisions. Inattentiveness, fatigue and increased speed are largely responsible for this. The increased speed has outmoded some of the advice formerly given to motorists. For example, the rule that you should leave one car-length between you and the car ahead for every ten miles per hour of your speed is still good advice on many roads, but is inadequate if applied to high-speed travel. On superhighways, where speeds approach or surpass sixty miles per hour, a smart motorist will keep more distance between himself and the car ahead so that he can stop in time.

Despite the special hazards of the new high-speed roads, safety experts have great hopes for the national system of interstate and defense highways. It is estimated that this system, which will be completed in 1970, will save perhaps 4,000 lives a year. The Bureau of Public Roads has this to say about the vast new highway program:



The student driver operates individual controls as he reacts to filmed driving situations presented by the Drivotrainer, supplementing on-the-road training.

"Crisscrossing the nation with 41,000 miles of expressways, the interstate system—the biggest peacetime public works program ever undertaken in world history—will connect 90 per cent of all cities of more than 50,000 population. Most of the routes will be four-lane divided highways, growing to six and eight lanes in and near metropolitan areas. The interstate system, although it constitutes only little more than one per cent of the nation's total road and street mileage, will carry 20 per cent of all traffic. Advantages of the system are obvious. Vacation and business travel will take much less time—and with greater comfort and less strain. The system will give new freedom, speed and safety to the movement of people and goods."

Just what can motorists look forward to on the highways of the future? By 1970, according to the Bureau of Public Roads, there will be about 100,000,000 automobiles that will be driven 1,000,000,000,000 miles annually by about 120,000,000 drivers. If today's mileage death rate (the number of deaths per 100,000,000 miles of motor-vehicle travel) remains the same, the death toll will climb from 37,800 in 1959 to about 55,000 in 1970. Although the 1959 figure seems appallingly high, it actually continues a steady trend downward in recent years. If this decline should continue, the 1970 death toll—in spite of the greater number of drivers and miles driven—may not compare unfavorably with that of today. Even though the mileage death rate has fallen to an all-time low, the records still show that each year about one in five drivers has a traffic accident of some kind.

Many traffic deaths, safety experts feel, could be prevented and many injuries lessened or avoided through the use of auto seat belts, which have been described as "the greatest single automotive safety device today." It is estimated that their use by all drivers could cut down the number of traffic deaths by five thousand a year. The National Safety Council, the American Medical Association and the United States Public Health Service are cosponsors of a nation-wide seat-belt campaign which has had extraordinary results in its first year. Sales were 100 per cent greater in the first nine months of 1959 than for the entire year of 1958. And, during the first year of the campaign, sales of belts in new cars produced by one of the big three rose by nearly a fifth. Seat belts are not, of course, a cure-all for traffic accidents, but they are the best self-help device now available for cutting down traffic deaths and injuries.

There is, however, no substitute for careful driving. Most safety men agree that careful driving is the key to the reduction of traffic casualties—more important even than foolproof cars and foolproof highways. In the opinion of most experts, "It's the nut behind the wheel who causes most traffic accidents." The driver must want, and know how, to drive safely. And he must accept the responsibilities that go with the possession of a driver's license if he is to behave creditably behind the wheel. Perhaps the best way to learn how to drive safely is to take a course in driver education. It has been found that those who have taken such courses commit far fewer violations

ROCKWELL MANUFACTURING CO

and have many less traffic accidents than others. Some safety experts believe that the number of traffic accidents could be cut by one third if every person were required to take a driver-education course before receiving an operator's license. They also predict that by 1970 all young drivers will take some form of driver-education courses in school. But, above all, what we need to solve our traffic problem is a new crop of drivers—more skilled, better informed and with an improved code of social, moral and personal responsibility.

Many people have asked the big question, "Just how safe are the new cars?" The answer is, "Just as safe as the driver makes them." Today's car is the safest car to drive that has ever been made. It has better brakes, greater range of vision, sturdier construction, improved door locks, padded dashboards, safety-rim wheels and other devices calculated to prevent accidents and reduce death and injury in case of accident. On the other hand, today's cars can be driven faster and accelerated faster than any that have preceded them. It is therefore up to the driver himself to cash in on the safety devices and to control the speed and horsepower.

The National Safety Council believes that you should buy a car primarily on the basis of obtaining safe, comfortable and dependable transportation. You should never buy a car without checking for safety features.

You may ask, "Why all this concern for safety?" Because traffic accidents, the great unsolved social problem of today, are killing thousands, injuring more than a million persons and costing the nation more than $5,500,000,000 each year. Whether the traffic toll soars to unheard-of heights or is held down in the face of an ever increasing number of cars, trucks and buses flooding the streets and highways every year depends to a great extent on how much you and I really care. It's up to us.

Traffic problems are worked out on a magnetic board by a student in driver education.

MONKMEYER

MOTELS COME OF AGE

By DOROTHY C. ROSAPEPE

Free-Lance Writer

MOTELS were originally simple, inexpensive and convenient overnight stopping places on the highway. Known first as tourist cabins, then as auto courts, cottages and tourist courts, the earliest ones merely provided sheltered places to sleep. The tired tourist could drive off the road, park his car at the cabin door, take in what he needed for the night and be on his way the next morning without any loss of time. There were no lobbies, no bellhops and no tipping. In fact, there was very little beyond a roof, a bed—most places did not furnish sheets—and a place to park outside the cabin door.

Today's motel bears no more resemblance to its pioneering forebears than today's sleek, comfortable, high-powered car does to the 1913 models that chugged off the road at Douglas, Arizona, to stop at a group of six tiny mining cottages converted that year into the first tourist cabins on record. Attractive, well-designed, beautifully landscaped and efficiently run motels today offer the ultimate in comfort, convenience, antiseptic cleanliness, and often a great deal more. Some 60,000 motels stud areas adjacent to American highways, turnpikes and thruways, cluster on the outskirts of towns and now have begun to appear in the business districts of large cities. They represent an investment of billions of dollars. There are airport motels, resort motels and motels that cater to business executives, conference groups and small conventions. Large corporations have moved in alongside independent owners and as competition has increased so have the size, the comfort, the service and the "extras" of the individual motel. But today's motel retains one thing in common with the tourist cabin of the past—the overnight guest still may park his car near at hand so that he may be on his way promptly in the morning.

In the early days of automobile travel, some people were wary of roadside cabins. They were used to staying in hotels where the formalities involved were familiar. Tourist homes, which flourished for a period after automobile travel became common, followed a similar, though less formal, pattern. They

Today motorists demand luxurious overnight quarters with fine restaurants, swimming pools and sometimes even supervised recreation. Years ago, when they wore goggles and dusters, they were happy to find beds for the night in an old-fashioned tourist camp.

PHILIP GENDREAU

NEW ENGLANDER MOTOR HOTEL

ranged from farmhouses to attractive old homes, which often beckoned to the weary traveler from spacious, tree-shaded lawns. But in the tourist cabins there was an element of adventure and their rates were about the same as those of tourist homes. Travelers who tried them usually found a friendly host who was anxious to please. Families welcomed the ease with which small children could be moved from car to bed without having to troop through a public lobby or reception room. Young early risers could explore the out-of-doors in the morning without clattering down stairs and waking other guests. So, over the years, more and more travelers began to seek out the cabins, cottages and courts along the road. As patronage grew, operators were able to improve their accommodations and to add more sleeping units. Travelers staying in one motel often asked the proprietor's advice in choosing another for the next night's stay. It was not long until noncompeting independent motel owners began to join together to establish standards for the budding industry. They helped travelers and each other by compiling lists of recommended motels.

Following World War II the industry grew by leaps and bounds. Automobile travel rose to new heights and motels vied for acceptance by recommending agencies. Motorists began to choose accommodations on the basis of "approved by" agency signs and motel group membership insignia displayed prominently with the motel name. The American Automobile Association had added motels to its listings of approved hotels and restaurants. Other recommending organizations, such as Duncan Hines, set their stamp of approval on motels that met their standards.

To qualify for the various badges of approval, motels needed attractive exteriors backed up by adequate facilities, meticulous housekeeping, a pleasant atmosphere and comfortable beds. Competition gave more importance to eye appeal as travelers found more and more recommended motels to choose from. Operators met this challenge with architectural individuality and decorative themes. A motel became quaint or modern, western, colonial or Latin American in decor. These new developments cost money. Gone were the days when the word "motel" stood for minimum comfort at minimum cost. Rates edged upward over the years, along with prices in general, and postwar travelers judged motels not on cost alone but in terms of attractiveness, comfort and convenience.

During the 1950's motels moved into areas far removed from the early tourist-court concept. The high standards of cleanliness and comfort as well as the basic convenience of parking facilities had won the favor of the commercial traveler. Traveling salesmen, covering their territories by car, planned itineraries with favorite roadside accommodations in mind. Soon they were reserving rooms in advance. Motel owners found that this took some of the risk from their operations, so they welcomed the steady patronage. Some operators today say that this commercial business accounts for nearly two thirds of their total annual occupancy. But the reservations of regular travelers left fewer rooms for tourists. "No Vacancy" signs appeared at popular motels earlier in the day. So motel groups urged tourists to make their own reservations in advance. Some groups and chains now offer free telephone-reservations service from one of their motels to another in the organization.

Since salesmen liked motel accommodations on the highway, it seemed logical to assume that they would welcome motels in convenient city locations. The city motel appeared and found broader services to perform. In addition to regular units, motel operators designed special sales-display rooms and rooms that could be used for meeting or display purposes in the daytime and as bedrooms at night. Having won over the salesman, the industry now is catering to the executive. Air travel and car rental together have opened up a whole new field of activity. New big city and suburban motels are geared to the executive's needs. Executive suites, meeting rooms, conference rooms, secretarial services and even facilities for small conventions are available in some of these lavish new establishments. Luxurious airport motels are springing up in various parts of the United States. Executives can fly in from the home office, hold conferences or sales meetings and fly back again without ever having left the airport. A more modest appeal to the traveling executive and other airlines passengers is Airwayte, an innovation at the Washington, D. C., National Airport, designed for use during long waits between flights. Accommodations are of Pullman type, with bed, desk, telephone, radio, lavatory and shower. The grounded guest may register at any time; a call system advises him of flight departure times.

Not least among the factors contributing to the expansion of the motel industry and the directions it has taken have been the American trends toward informality and outdoor living. Today's motels provide both, with convenience and luxury thrown in. Free television and air conditioning rank as "musts" for a successful motel, and swimming pools are fast becoming almost as important. Restaurants, either within the motel itself or close by, are considered basic; continental breakfasts (coffee and rolls), served without cost, are popular. Playgrounds and wading pools for children, cribs, shuffleboard courts, private patios, baby sitters, cocktail lounges, putting greens and room telephones have all become commonplace. At least one motel has underwater music in its pool and another has an underwater lift that raises swimmers to a nonslip platform at the pool's edge so that they need not climb out of the pool themselves. Some offer fishing piers, golf courses, tennis courts, country-club privileges, barbecue pits complete with ready-to-cook meals, laundry facilities, game rooms, ice-skating rinks, boating, libraries and free pony rides.

A Florida motel features a missile-observation deck and another offers courtesy car service to guests. Some motels have multilingual staffs. Others give patrons a chance to pick oranges from trees, to fish in private lakes, to picnic in motel-owned woods. In the midst of all this gay abandon, one motel operator keeps his feet solidly on the ground—he provides alarm-clock service for his guests.

The motel industry got its start as a loose gathering of small businesses scattered over the whole United States. The term "motel" is said to have been coined in 1925 by the contraction of the words "*mo*tor" and "ho*tel*" into a single word. According to the American Motor Hotel Association, the national trade association of the motor hotel and motor court industry, it is believed to have been first used for the Milestone Motel, an old mission converted into tourist lodgings at San Luis Obispo, California. Today some organizations have dropped the

UPPER LEFT. EWING GALLOWAY: UPPER RIGHT. TOUCHÉ: LOWER LEFT AND LOWER RIGHT. DAVID W. CORSON FROM A. DEVANEY

A motel cabin camp, above, in the White Mountains. Below, a modern motel near Pikes Peak, Colorado.

Above, the Hilton Inn, near the New Orleans airport. The Castaways, below, motel at Miami Beach, Florida.

contracted form and use the full "motor hotel" in their names to indicate that they offer hotel-type services. There are motor lodges, motor inns, lodge motels and other combination names, each intended to describe the spirit and facilities of the particular establishment.

Today the motel industry has moved into the realm of big business—and some individual motels and chains are big business in themselves. But there are still big motels and small ones, gay motels and quiet ones, elaborate ones and simple ones. There are motels owned by big corporations and others owned by individuals. Because there are so many, the motel owner must keep his property up to date, make improvements and add services, or he will lose out to his competitors. Added services and constant improvement mean rising operating costs. One way to meet that challenge is to increase the number of rental units. so the average number of rooms per motel has moved steadily upward over the past several years. Most corporate builders now consider forty units as small and sixty to eighty as average. The single motel, operated as a small business venture, is playing a smaller role than it formerly did, for the trend is toward multiple ownership.

Expansion is expressed in broad and sweeping terms. Building costs are discussed in terms of hundreds of thousands of dollars, and some recent structures represent investments of a million dollars, two million and even more. That takes capital. Some has come from the motel industry itself, from organizations that have been expanding over the years; some has come from the construction field and. in some areas. local businessmen have formed independent corporations for building one or more motels. Both hotel groups and restaurant chains have entered the motel field in recent years, and they think in terms of geographical distribution. Some consider four hundred motels a desirable number for one chain.

The motel industry has grown along with the expansion in automobile ownership. the improvement of highways and the American liking for the open road. It has moved from its beginnings as a family sideline to bring in extra income to a vast network of properties capable of handling hundreds of millions of overnight guests each year.

EMPLOYMENT PATTERNS IN THE UNITED STATE

Significant changes are taking place in the composition of the United States labor force and in the type of work done. By projecting already established trends, it is possible to predict how these changes will affect workers and industries of the future.

THE CHANGING WORK FORCE

OCCUPATIONAL GROUP	1959	PER CENT OF TOTAL WORK FORCE	1970	PER CENT OF TOTAL WORK FORCE
Professional and technical workers	7,100,000	11	10,400,000	13
Proprietors and managers	6,900,000	10	8,800,000	11
Clerical and sales workers	13,700,000	21	17,600,000	22
Skilled workers	8,600,000	13	10,800,000	13
Semiskilled workers	11,900,000	18	14,800,000	18
Service workers	8,000,000	12	10,100,000	12
Unskilled workers	3,700,000	6	3,800,000	5
Farmers and farm workers	5,600,000	9	4,900,000	6

SOURCE: *Bureau of Labor Statistics*

THE RISE OF THE SERVICE INDUSTRIES

Service industries provide services rather than products; trade, government services, transportation, public utilities, finance and insurance, among others, come within this category. Production industries include manufacturing, agriculture, construction and mining.

YEAR	NUMBER EMPLOYED IN PRODUCTION INDUSTRIES	PER CENT OF TOTAL WORK FORCE	NUMBER EMPLOYED IN SERVICE INDUSTRIES	PER CENT OF TOTAL WORK FORCE
1930	22,100,000	56	17,400,000	44
1940	22,500,000	54	19,100,000	46
1950	25,700,000	49	26,500,000	51
1960	27,200,000	45	33,400,000	55
1970	31,100,000	43	41,900,000	57

SOURCE: *Bureau of Labor Statistics*

THE WORKING POPULATION: MALE AND FEMALE

YEAR	TOTAL WORK FORCE	MALE	PER CENT OF TOTAL WORK FORCE	FEMALE	PER CENT OF TOTAL WORK FORCE
1930	50,080,000	39,062,000	78	11,018,000	22
1940	56,030,000	41,870,000	75	14,160,000	25
1950	64,599,000	45,919,000	71	18,680,000	29
1960	73,372,000	49,751,000	68	23,621,000	32
1970	86,604,000	56,213,000	65	30,391,000	35

SOURCE: *The Population of the United States*, Donald J. Bogue, the Free Press of Glencoe, Illinois, 1959

AGE DISTRIBUTION IN THE WORKING POPULATION

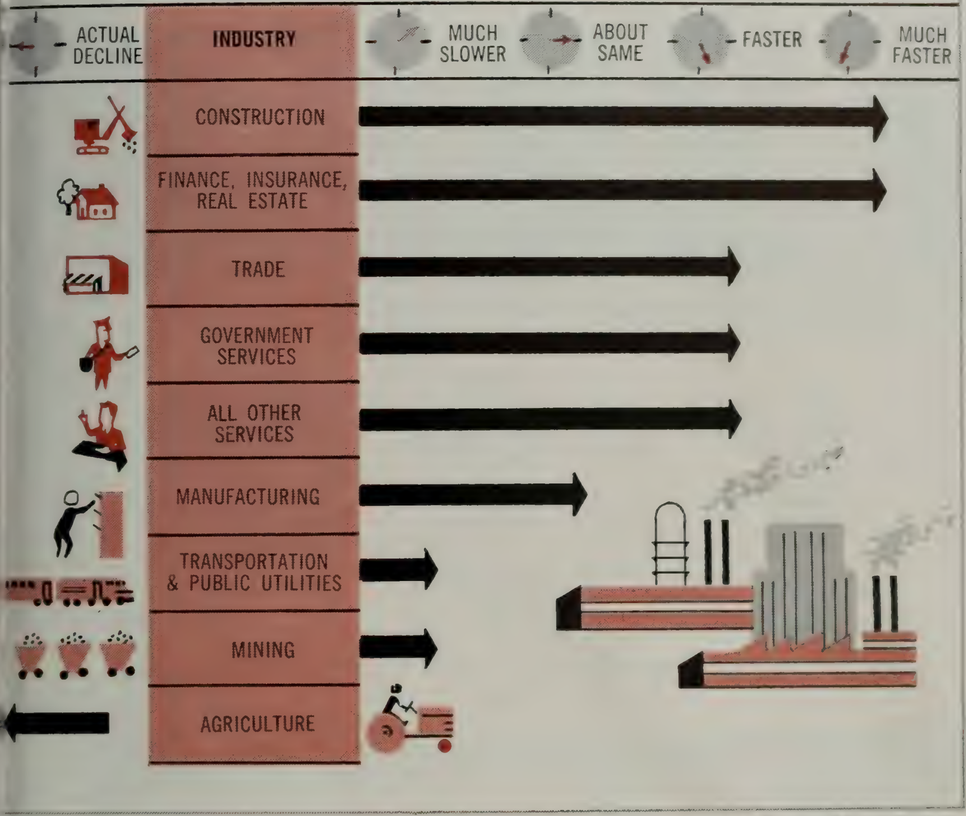
AGE	1960	1970	CHANGE IN NUMBER	PER CENT OF CHANGE
Under 25	13,800,000	20,200,000	6,400,000	46
25 through 34	15,300,000	17,100,000	1,800,000	12
35 through 44	16,600,000	16,400,000	−200,000	−1
45 and over	27,900,000	33,400,000	5,500,000	20

SOURCE: *Bureau of Labor Statistics*

PROJECTED GROWTH RATES OF MAJOR INDUSTRIES

1960 - 1970

COMPARED WITH EXPECTED 20 PER CENT RISE IN EMPLOYMENT



SOURCE: Bureau of Labor Statistics

WORK-LIFE EXPECTANCY FOR MEN: 1900 TO 2000

Better health measures and higher standards of living since the turn of the century have greatly increased life expectancy. As a result, workers today have a longer working life, as well as more years of leisure.

	AT AGE 20	
YEAR	WORKING LIFE	RETIREMENT
1900	39.4 years	2.8 years
1940	41.3 "	5.5 "
1950	43.2 "	5.7 "
1955	43.0 "	6.5 "
2000	45.1 "	8.7 "
GAINS:		
Change from 1900 to 1950	+3.8 "	+2.9 "
Change from 1950 to 2000	+1.9 "	+3.0 "

SOURCE: *The Population of the United States*, Donald J. Bogue, the Free Press of Glencoe, Illinois, 1959

BALANCE OF TRADE

Economists have for centuries considered the balance of trade, or the relationship between exports and imports, an important economic factor in the general prosperity of a nation. The traditional point of view has been that a plus balance—one in which exports exceed imports—is "favorable." Because many different items are traded, the balance is expressed as a money value. The trade balance can also indicate the flow of products from one country or region to another.

BALANCE OF TRADE—TEN SELECTED COUNTRIES

	1953	1955	1957	1959
ARGENTINA	+$ 330,000,000	−$ 244,000,000	−$ 335,000,000	+$ 16,000,000
CANADA	+231,000,000	−372,000,000	−890,000,000	−683,000,000
DOMINICAN REPUBLIC	+6,000,000	+1,000,000	+25,000,000	−6,000,000
FRANCE	+160,000,000	−174,000,000	−1,064,000,000	−527,000,000
WEST GERMANY	+618,000,000	+342,000,000	+1,076,000,000	+1,327,000,000
ISRAEL	−221,000,000	−235,000,000	−292,000,000	−255,000,000
ITALY	−913,000,000	−583,000,000	−1,122,000,000	−450,000,000
UNITED KINGDOM	−1,835,000,000	−2,399,000,000	−1,716,000,000	−1,495,000,000
UNITED STATES	+3,990,000,000	+3,197,000,000	+6,565,000,000	+1,094,000,000
YUGOSLAVIA	−209,000,000	−184,000,000	−266,000,000	−210,000,000

NOTE: A plus balance indicates the amount by which commodities exported exceeded those imported. A minus balance shows the amount by which imported goods exceeded those exported.

TEN LARGEST TRADERS IN 1959[1]

	EXPORTS	IMPORTS
UNITED STATES	$17,576,000,000	$16,482,000,000
UNITED KINGDOM	9,677,000,000	11,172,000,000
WEST GERMANY	9,805,000,000	8,478,000,000
CANADA	5,692,000,000	6,375,000,000
FRANCE	5,615,000,000	5,088,000,000
NETHERLANDS	3,607,000,000	3,939,000,000
JAPAN	3,456,000,000	3,599,000,000
BELGIUM–LUXEMBOURG [2]	3,295,000,000	3,442,000,000
ITALY	2,895,000,000	3,341,000,000
SWEDEN	2,206,000,000	2,405,000,000

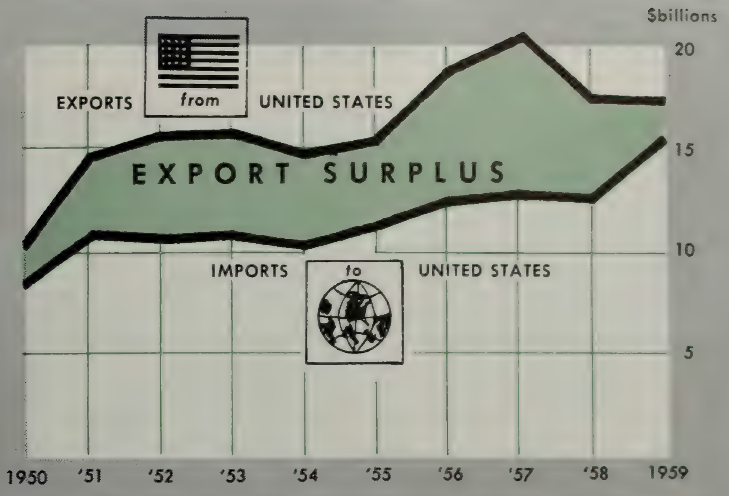
[1] Based upon the total amount of goods traded.
[2] Belgium and Luxembourg have been joined in an economic union since 1922.

EXPORT PRICES[1] OF SELECTED COMMODITIES

	1951	1953	1955	1957	1959
Coal *(ton)*					
UNITED STATES	$ 8.76	$ 8.39	$ 8.56	$10.00	$ 9.38
WEST GERMANY	8.10	11.25	11.19	12.64	13.24
UNITED KINGDOM	8.73	10.47	10.22	13.10	8.73
Wheat *(bushel)*					
UNITED STATES	2.40	2.24	2.26	2.24	1.98
CANADA	2.18	2.09	1.77	1.72	1.74
AUSTRALIA	1.94	2.19	1.59	1.56	1.50
ARGENTINA	2.22	2.62	1.85	1.63	1.53
Zinc *(100 pounds)*					
CANADA	18.91	12.14	13.84	13.27	12.77
MEXICO	17.37	10.89	10.42	12.31	8.87
Coconut oil *(100 pounds)*					
PHILIPPINES	15.87	15.56	10.88	10.66	18.12
CEYLON	18.18	13.99	10.33	11.10	15.53
MALAYA	19.23	14.54	10.88	11.36	15.96
Hemp *(100 pounds)*					
PHILIPPINES	22.30	13.82	10.80	16.19	20.90
Rice *(100 pounds)*					
THAILAND	5.70	7.23	5.38	5.06	5.08
BURMA	5.18	7.74	4.62	4.12	4.00
UNITED STATES	9.80	10.74	9.90	9.10	8.80

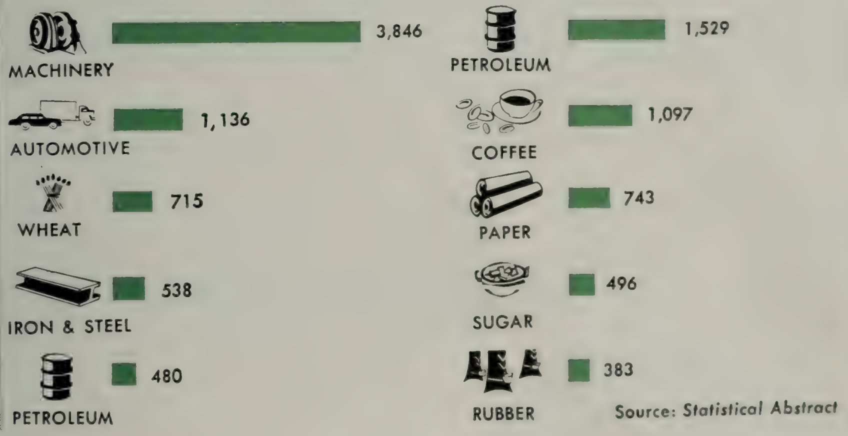
[1] Wholesale prices computed at point of shipment.

SOURCE, PRECEDING TABLES: International Monetary Fund



1959

5 LEADING EXPORTS ($ millions) 5 LEADING IMPORTS



Source: *Statistical Abstract*

CANADA'S BALANCE OF TRADE ANALYZED

(Millions of Canadian Dollars)

YEAR	ALL COUNTRIES	UNITED KINGDOM	OTHER COMMONWEALTH	UNITED STATES	LATIN AMERICA	BENELUX	FRANCE	WEST GERMANY	OTHER EUROPE	JAPAN	REST OF WORLD
1950	−1.4	+5.5	−4.7	−9.1	−5.8	+3.6	+0.3	−0.2	+5.1	+0.7	0.0
1952	**+27.1**	**+32.2**	**+6.4**	**−55.9**	**−1.0**	**+8.1**	**+2.4**	**+6.0**	**+12.6**	**+7.5**	**+4.3**
1954	−12.2	+21.8	+1.2	−53.7	−8.1	+3.9	+1.0	+3.5	+6.0	+6.4	+0.4
1956	**−70.2**	**+27.3**	**+1.9**	**−111.9**	**−15.5**	**+3.0**	**+1.7**	**+3.8**	**+12.0**	**+5.6**	**−4.1**
1958	−22.0	+35.2	+6.1	−62.0	−14.2	+6.6	+0.4	+8.0	+6.2	+2.8	−5.2
- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
1958	**−13.0**	**+21.1**	**+6.1**	**−54.3**		**+6.8**	**+0.4**	**+8.2**		**+2.9**	**+5.6**
1959	−30.7	+16.5	+2.9	−52.2		+3.0	−1.1	+0.5		+3.0	−7.7

NOTE: All values are monthly averages. The dashed line indicates a break in continuity due to a revised method of analysis. Below the line various noncommercial and special transactions are omitted from the balances. Below the line also balances for Latin America and Other Europe are not listed, while Rest of World includes figures for all countries except the United States and those of the British Commonwealth.

SOURCE: *Canadian Statistical Review*

ADVERTISING IN THE UNITED STATES

Whether a "hard sell" or a "soft sell," a "plug" or a "spot," the back cover of a national magazine or the slogan on a package of cake mix, advertising in some form or other touches every American's life many times a day. Vast sums of money are spent to insure that as many people as possible are exposed to whatever the advertiser is selling. In the scramble to reach the largest number of potential customers, advertisers use all "media"—newspapers, magazines, billboards, radio and so forth. The medium that seems to have the greatest impact becomes the medium most sought after; currently it is television. For a variety of reasons, however, certain products seem to sell better when advertised in one of the other media. Clothing, for example, is more often advertised in magazines and newspapers, possibly because a prospective buyer likes to examine a new suit closely before deciding to approve of it. Television is usually unsuited for such examination.

SPENDING FOR ADVERTISING, BY MEDIA

MEDIUM	1950	1953	1956	1959 [1]
Newspapers	$2,075,600,000	$2,644,800,000	$3,235,600,000	$ 3,517,000,000
Magazines	514,900,000	667,400,000	794,700,000	866,200,000
Television	170,800,000	606,100,000	1,206,700,000	1,525,500,000
Radio	605,400,000	611,200,000	567,000,000	638,000,000
Direct mail	803,200,000	1,099,100,000	1,419,200,000	1,573,000,000
Business papers	251,100,000	395,000,000	496,000,000	566,000,000
Outdoor	142,500,000	176,300,000	201,300,000	193,200,000
Miscellaneous	1,146,500,000	1,555,400,000	1,984,200,000	2,211,100,000
TOTAL	5,710,000,000	7,755,300,000	9,904,700,000	11,090,000,000

[1] Preliminary.

NOTE: Since the figures in this table include indirect expenditures (agency fees, production costs and so forth) for advertising in the various media, while the other tables in this section are for direct expenditures only, the figures in this table are considerably higher.

SOURCES: *Printers' Ink;* McCann-Erickson, Inc.

DIRECT EXPENDITURES FOR PRINCIPAL PRODUCTS ADVERTISED IN MAGAZINES IN 1959

Foods, soft drinks and confections	$105,028,000
Motor vehicles and accessories	80,646,000
Drugs and toiletries	75,449,000
Household equipment, supplies and furnishings	66,941,000
Alcoholic beverages	51,255,000
Industrial materials	$ 50,231,000
Apparel and accessories	49,907,000
Building materials	33,961,000
Smoking materials	27,291,000
Soap, cleansers and so forth	10,378,000
All other products and services	234,592,000

TOTAL $785,679,000

SOURCE: *Survey of Current Business*

DIRECT EXPENDITURES FOR PRINCIPAL PRODUCTS ADVERTISED OVER TELEVISION IN 1959

Foods, soft drinks and confections	$320,765,115	Household equipment, supplies and furnishings	$57,726,646
Drugs and toiletries	292,800,272	Alcoholic beverages	54,555,256
Soap, cleansers and so forth	138,756,556	Consumer services	35,705,326
Smoking materials	106,659,190	Gasoline and lubricants	32,831,894
Motor vehicles and accessories	65,031,388	Apparel and accessories	22,896,159
		All other products and services	95,186,728

TOTAL $1,232,914,530

SOURCE: Television Bureau of Advertising, Inc.

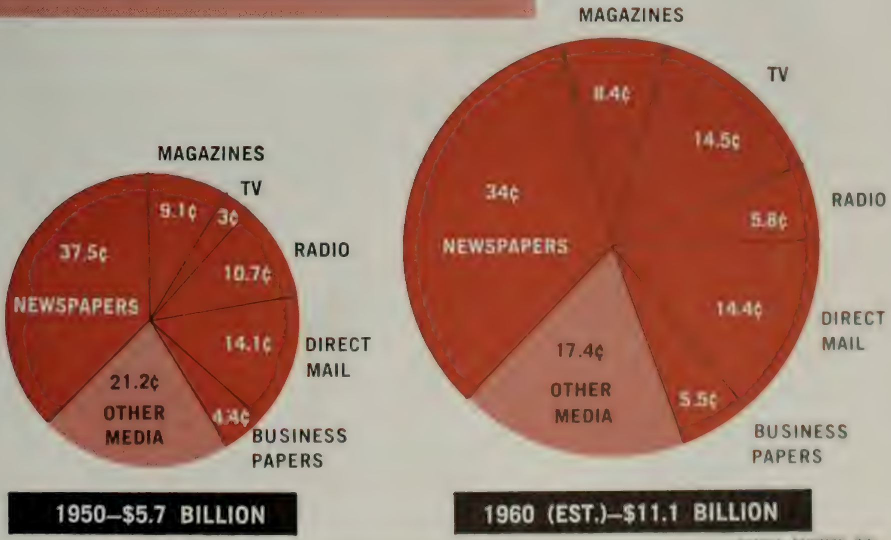
DIRECT EXPENDITURES FOR PRINCIPAL PRODUCTS ADVERTISED IN NEWSPAPERS IN 1959

Motor vehicles and accessories	$152,461,000	Radio and television products and services	$ 28,688,000
Foods, soft drinks and confections	140,222,000	Household equipment, supplies and furnishings	27,038,000
Alcoholic beverages	62,300,000	Gasoline and lubricants	25,999,000
Transportation	49,986,000	Publications	24,181,000
Drugs and toiletries	47,771,000	All other products and services	196,942,000
Smoking materials	41,498,000		

TOTAL $772,905,000

SOURCE: Compiled for Bureau of Advertising of the American Newspaper Publishers Association, Inc., by Media Records, Inc.

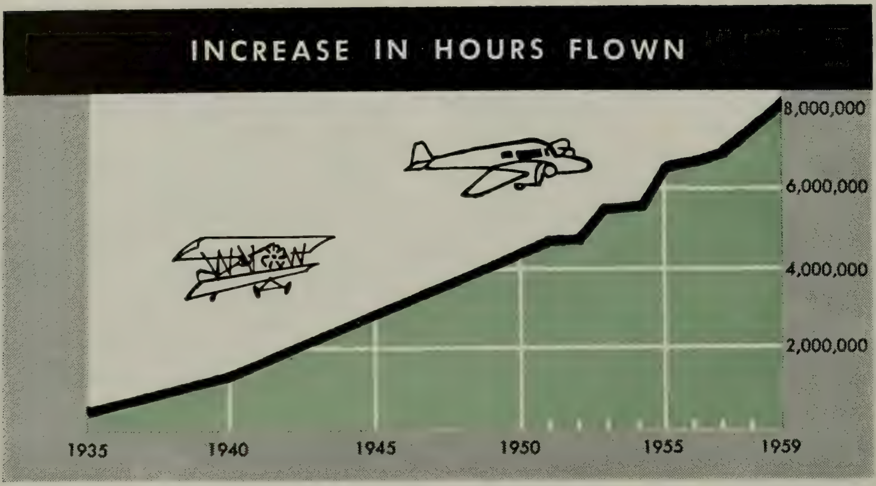
THE GROWING ADVERTISING BUDGET



1950—$5.7 BILLION

1960 (EST.)—$11.1 BILLION

PRIVATE FLYING IN THE UNITED STATES



THE INCREASE IN PRIVATE FLYING

Year	Number of Pilots	Hours Flown
1935	6,707	433,000
1940	49,607	1,284,000
1951	371,861	4,830,000
1952	376,286	4,753,000
1953	377,854	5,472,000
1954	398,913	5,795,000
1955	418,359	6,275,000
1956	432,688	6,700,000
1957	448,470	6,973,000
1958	467,234	7,500,000
1959	483,627	8,100,000

SOURCES: *Aviation Facts and Figures, 1959,* American Aviation Publications, Inc.; and *FAA Statistical Handbook of Aviation, 1959*

NUMBER OF PRIVATELY OWNED PLANES, 1958

(Per 10,000 people)

United States Total	3.9
Alabama	1.9
Alaska	53.2
Arizona	8.0
Arkansas	4.7
California	5.9
Colorado	5.8
Connecticut	2.3
Delaware	4.7
District of Columbia	3.4
Florida	4.8
Georgia	2.2
Hawaii	1.5
Idaho	10.0
Illinois	3.6
Indiana	4.3
Iowa	5.8
Kansas	9.1
Kentucky	1.7
Louisiana	3.5
Maine	3.4
Maryland	2.1
Massachusetts	1.8
Michigan	3.6
Minnesota	5.7
Mississippi	3.0
Missouri	3.4
Montana	14.1
Nebraska	8.1
Nevada	11.2
New Hampshire	3.1
New Jersey	2.2
New Mexico	8.5
New York	1.7
North Carolina	2.5
North Dakota	9.6
Ohio	3.3
Oklahoma	6.3
Oregon	7.5
Pennsylvania	2.3
Rhode Island	1.7
South Carolina	1.6
South Dakota	10.8
Tennessee	2.2
Texas	6.2
Utah	5.1
Vermont	2.9
Virginia	2.2
Washington	6.3
West Virginia	1.8
Wisconsin	3.8
Wyoming	12.5

SOURCES: *FAA Statistical Handbook of Aviation, 1959* and *Statistical Abstract of the United States*

MOTOR-VEHICLE ACCIDENTS IN THE UNITED STATES

Motor-vehicle accidents account for the largest percentage of accidental deaths in the United States. It is impossible to state the exact cause of most motor-vehicle accidents because nearly all are caused by a combination of circumstances. Nevertheless, speeding continues to be the factor most often reported in fatal vehicle accidents in the United States.

MOTOR-VEHICLE DEATHS ON MAJOR HOLIDAYS

	MEMORIAL DAY		FOURTH OF JULY		LABOR DAY		CHRISTMAS		NEW YEAR	
YEAR	IMMEDIATE DEATHS[1]	TOTAL DEATHS[2]	IMMEDIATE DEATHS	TOTAL DEATHS	IMMEDIATE DEATHS	TOTAL DEATHS	IMMEDIATE DEATHS	TOTAL DEATHS	IMMEDIATE DEATHS	TOTAL DEATHS
1951	81(1) [3]	125	105(1)	160	461(3)	615	535(4)	670	375(4)	470
1952	363(3)	485	366(3)	490	432(3)	575	556(4)	695	407(4)	510
1953	241(2)	345	261(2)	375	405(3)	540	523(3)	695	317(3)	420
1954	362(3)	485	348(3)	465	364(3)	485	392(2)	560	296(2)	425
1955	368(3)	490	407(3)	540	438(3)	585	609(3)	810	364(3)	485
1956	109(1)	170	137(1)	210	435(3)	580	706(4)	885	409(4)	510
1957	94(1)	145	426(4)	535	445(3)	595	224(1)	345	160(1)	245
1958	371(3)	495	370(3)	495	420(3)	560	594(4)	740	377(4)	470
1959	310(2)	445	276(2)	395	438(3)	585	493(3)	660	374(3)	500

[1] Immediate deaths include only those occurring by midnight of the last day of the holiday period.

[2] Total deaths include immediate deaths and an estimate of delayed deaths—those that occur within twelve months after the day of the accident and as a result of the accident.

[3] Figures in parentheses show number of full days in each holiday period. Deaths are for these days and the last six hours of the preceding day.

SPEED AS A CAUSE OF TRAFFIC ACCIDENTS

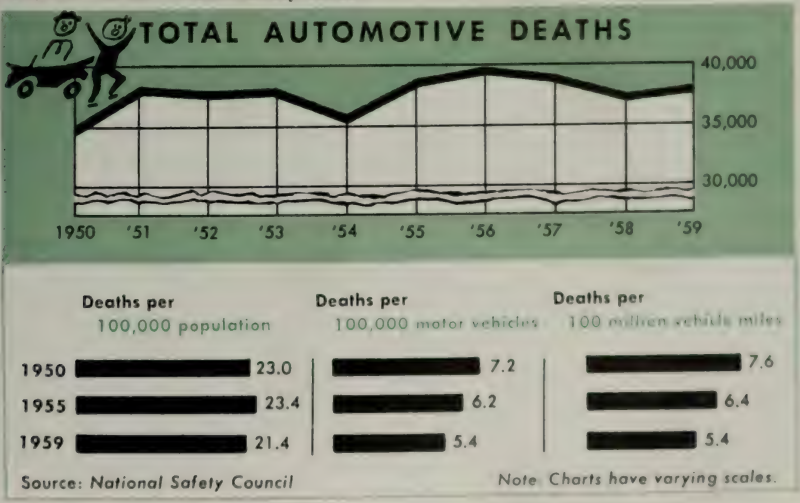
	PER CENT OF DRIVERS IN FATAL ACCIDENTS CAUSED BY SPEEDING[1]			PER CENT OF FATAL ACCIDENTS RESULTING FROM SPEED VIOLATIONS
YEAR	TOTAL	EXCEEDING STATED LIMIT[2]	EXCEEDING SAFE SPEED[3]	
1951	28	14	14	35
1952	28	17	11	35
1953	29	15	14	35
1954	31	18	13	35
1955	31	17	14	37
1956	32	22	10	38
1957	31	21	10	38
1958	30	20	10	37
1959	30	20	10	37

[1] Accident percentage is higher than driver percentage because in some multi-vehicle accidents only one driver was speeding.

[2] Stated limit is the speed posted on road signs.

[3] Safe speed is the maximum speed for a given section of road, in view of weather and other road conditions.

SOURCE, ALL TABLES: National Safety Council



Source: *National Safety Council*

Note Charts have varying scales.

HEALTH INSURANCE AND MEDICAL COSTS IN THE UNITED STATES

Since the first United States health-insurance company was organized in 1847, the health-insurance movement has grown faster than the population. Currently, about one quarter of the nation's total medical bill, one third of the physician's bill and more than half the hospital bill are met by some form of insurance. Group insurance-company policies, which protect limited groups such as the employees of firms, have become very popular since 1945, and individual and family policies have also gained since that date. Another expanding field, started only about ten years ago, is major-medical-expense coverage, which insures against long or very expensive illnesses or injuries. Blue Cross and Blue Shield, which protect large numbers against hospital and surgical expenses, have shared the expanding health-insurance field with the private companies.

Many people have acquired health insurance for themselves and their dependents because of the rising cost of medical care. An earlier concept was that health insurance should protect a family only from loss of income incurred when the breadwinner was ill or had an accident. With growing medical costs, many have come to believe that the family should be protected against the large financial burden that occurs when accident or illness strikes any member.

NUMBER OF PEOPLE WITH HEALTH-INSURANCE PROTECTION[1]

By type of coverage

YEAR [2]	HOSPITAL EXPENSE	SURGICAL EXPENSE	REGULAR MEDICAL EXPENSE [3]	MAJOR MEDICAL EXPENSE [4]	LOSS OF INCOME [5]
1947	52,584,000	26,247,000	8,898,000	. .	30,574,000
1949	66,044,000	41,143,000	16,862,000	. .	33,626,000
1951	85,348,000	64,892,000	27,723,000	108,000	38,035,000
1953	97,303,000	80,982,000	42,684,000	1,220,000	39,571,000
1955	107,662,000	91,927,000	55,506,000	5,241,000	39,513,000
1957	121,432,000	108,931,000	71,813,000	13,262,000	42,939,000
1959	127,896,000	116,944,000	82,615,000	21,850,000	43,169,000

[1] Net total of people protected—eliminates duplication among persons protected by more than one kind of insuring organization or more than one insurance-company policy providing the same type of coverage.

[2] Number of protected people has been computed for the end of each year.

[3] Covers physicians fees, both in and out of the hospital or office, and other costs connected with nonhospital care, such as nursing, medication and so forth at home.

[4] Protects against prolonged or very expensive illness or injury; a characteristic of major-medical-expense insurance is that coverage begins only after a certain amount of the medical expense has been paid for by the person insured.

[5] Protects against loss of income due to illness or accident.

SOURCE: Health Insurance Council

NUMBER OF DEPENDENTS PROTECTED BY HEALTH INSURANCE

		NUMBER OF PEOPLE PROTECTED [1]		
TYPE OF PROTECTION	YEAR [2]	TOTAL	PRIMARY INSUREDS [3]	DEPENDENTS
Hospital expense	1953	97,303,000	43,166,000	54,137,000
	1959	127,896,000	53,569,000	74,327,000
Surgical expense	1953	80,982,000	35,372,000	45,610,000
	1959	116,944,000	47,487,000	69,457,000
Regular medical expense	1953	42,684,000	19,923,000	22,761,000
	1959	82,615,000	34,140,000	48,475,000
Major medical expense	1953	1,220,000	578,000	642,000
	1959	21,850,000	8,543,000	13,307,000

[1] Net total of people protected—eliminates duplication among persons protected by more than one kind of insuring organization or more than one insurance-company policy providing the same type of coverage.

[2] Number of protected people has been computed for the end of each year.

[3] Primary insureds are policyholders under individual policies and insured employees under group policies.

SOURCE: Health Insurance Council

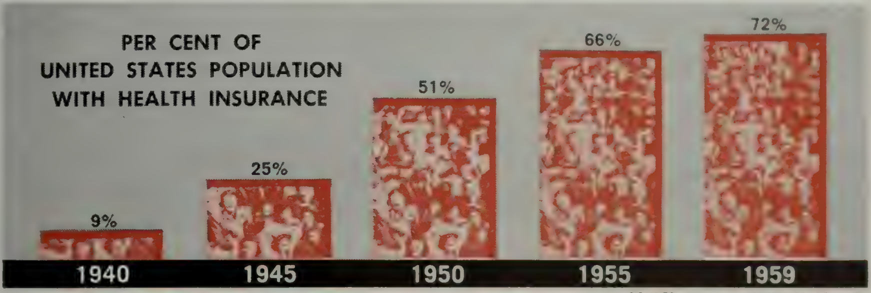
HEALTH-INSURANCE BENEFIT PAYMENTS

By type of policy

YEAR	GRAND TOTAL	BY INSURANCE COMPANIES[1] TOTAL	BY INSURANCE COMPANIES[1] GROUP POLICIES	BY INSURANCE COMPANIES[1] INDIVIDUAL AND FAMILY POLICIES	BY BLUE CROSS, BLUE SHIELD AND OTHER[2] HOSPITAL-MEDICAL PLANS
1949	$ 957,000,000	$ 507,000,000	$ 294,000,000	$213,000,000	$ 450,000,000
1951	1,601,000,000	989,000,000	663,000,000	326,000,000	612,000,000
1953	2,445,000,000	1,380,000,000	970,000,000	410,000,000	1,065,000,000
1955	3,125,000,000	1,785,000,000	1,252,000,000	533,000,000	1,340,000,000
1957	4,247,000,000	2,395,000,000	1,806,000,000	589,000,000	1,852,000,000
1959	5,175,000,000	2,840,000,000	2,146,000,000	694,000,000	2,335,000,000

[1] Includes loss of income and excludes accidental-death and dismemberment benefits.
[2] Independent and medical-society-approved or -sponsored plans.

SOURCE: *Accident and Sickness Review; Spectator Accident Insurance Register;* Health Insurance Council; and Health Insurance Association of America



SOURCE: HEALTH INSURANCE COUNCIL

PHILIP GENDREAU

PRIVATE EXPENDITURES FOR MEDICAL CARE[1]

(Millions of dollars)

YEAR	TOTAL MEDICAL CARE	HOSPITAL SERVICES	PHYSICIANS' SERVICES	MEDICINES AND APPLIANCES	DENTISTS' SERVICES	ALL OTHER MEDICAL CARE[2]
1949	$ 7,900	$1,900	$2,500	$2,000	$ 900	$600
1951[3]	9,400	2,500	2,700	2,500	1,000	600
1953	11,000	3,200	3,100	2,800	1,200	700
1955	12,800	3,800	3,500	3,200	1,500	800
1957	15,500	4,600	4,200	4,100	1,700	900
1959	18,300	5,500	5,000	4,800	2,000	1,000

[1] Includes all personal-consumption expenditures for medical care and health insurance.
[2] Includes other professional services and nursing-home care.
[3] Expenditures in separate fields do not add up to the total because of rounding.

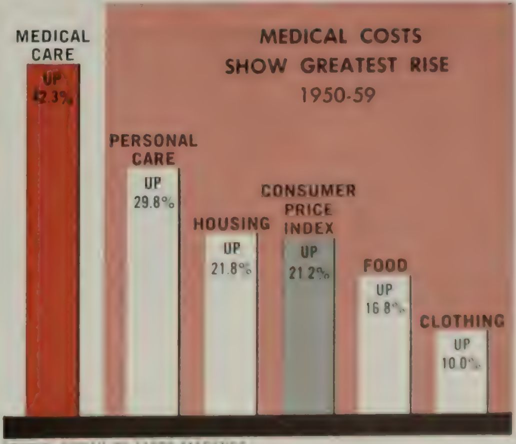
SOURCE: United States Department of Commerce; United States Department of Health, Education and Welfare

AVERAGE COST PER PATIENT-DAY TO HOSPITAL PATIENTS[1]

YEAR	AVERAGE COST PER PATIENT-DAY[2]
1947	$11.09
1949	14.33
1951	16.77
1953	19.95
1955	23.12
1957	26.02
1959	30.19

[1] Including fees for room and board, laboratory costs, X rays, medication, nursing, staff physicians and so forth.
[2] Cost is figured for patients in non-Federal, short-term general and special hospitals, excluding psychiatric and tuberculosis hospitals.

SOURCE: American Hospital Association



SOURCE: BUREAU OF LABOR STATISTICS

UNITED STATES LABOR: UNION MEMBERSHIP AND WORK STOPPAGES

SIX LARGEST LABOR UNIONS IN 1958

UNION	NUMBER OF MEMBERS	UNION	NUMBER OF MEMBERS
Teamsters	1,418,000	Steelworkers	960,000
Automobile workers	1,027,000	Carpenters	835,000
Machinists	993,000	Electrical workers	750,000

MEMBERSHIP OF NATIONAL AND INTERNATIONAL UNIONS WITH HEADQUARTERS IN THE UNITED STATES

From 1956 to 1958 the steelworkers and automobile-workers unions lost, between them, more than 500,000 members. This loss was only partially offset by gains in the teamsters and electrical-workers unions. Automation has undoubtedly been a contributing cause in this decline. Automation affects employment in manufacturing industries far more, as a general rule, than it does in such industries as transportation or construction.

YEAR	NUMBER OF MEMBERS	PER CENT OF TOTAL LABOR FORCE [1]	PER CENT OF TOTAL LABOR FORCE, EXCLUSIVE OF AGRICULTURAL WORKERS [1]
1935	3,728,000	6.7	13.4
1940	8,944,000	15.5	27.2
1945	14,796,000	21.9	35.8
1950	14–16,000,000	22.0	31.9
1955	17,749,000	24.4	33.6
1956	18,477,000	24.8	33.7
1957	18,430,590	24.5	33.1
1958 [2]	18,080,567	23.8	33.5

[1] Canadian members of international unions not included in percentage columns.
[2] Latest available figures.

WORK STOPPAGES IN THE UNITED STATES

The percentage of total working time lost through strikes and lockouts, after nearly a fifteen-year decline, rose suddenly in 1959. Most of this rise was a direct result of the steel strike of that year, the longest industry-wide steel strike in history.

YEAR	WORK STOPPAGES		WORKERS INVOLVED [1]		MAN-DAYS LOST DURING THE YEAR [2]	
	NUMBER [1]	AVERAGE DURATION IN DAYS [3]	NUMBER	PER CENT OF TOTAL LABOR FORCE	NUMBER	PER CENT OF TOTAL WORKING TIME [4]
1946	4,985	24.2	4,600,000	14.5	116,000,000	1.43
1949	3,606	22.5	3,030,000	9.0	50,500,000	.59
1952	5,117	19.6	3,540,000	8.8	59,100,000	.57
1955	4,320	18.5	2,650,000	6.2	28,200,000	.26
1958	3,694	19.7	2,060,000	4.8	23,900,000	.22
1959	3,708	24.6	1,880,000	4.3	69,000,000	.61

[1] Calculated for only those work stoppages beginning during the specified year.
[2] Includes all work stoppages in effect during the year.
[3] Duration in calendar days rather than working days; calculated for only those work stoppages ending during the specified year.
[4] Total working time is estimated.

MAJOR ISSUES INVOLVED IN UNITED STATES WORK STOPPAGES

Number of stoppages listed by major issues

YEAR	WAGES AND HOURS [1]	UNION ORGANIZATION (PRINCIPALLY UNION RECOGNITION)	UNION ORGANIZATION AND WAGES AND HOURS	OTHER WORKING CONDITIONS [2]	INTERUNION OR INTRAUNION MATTERS [3]	UNKNOWN	TOTAL
1951	2,102	682	206	1,342	326	79	4,737
1953	2,825	543	202	1,135	275	111	5,091
1955	2,154	539	305	964	299	59	4,320
1957	1,730	442	309	837	326	29	3,673
1959	1,872	303	361	761	350	61	3,708

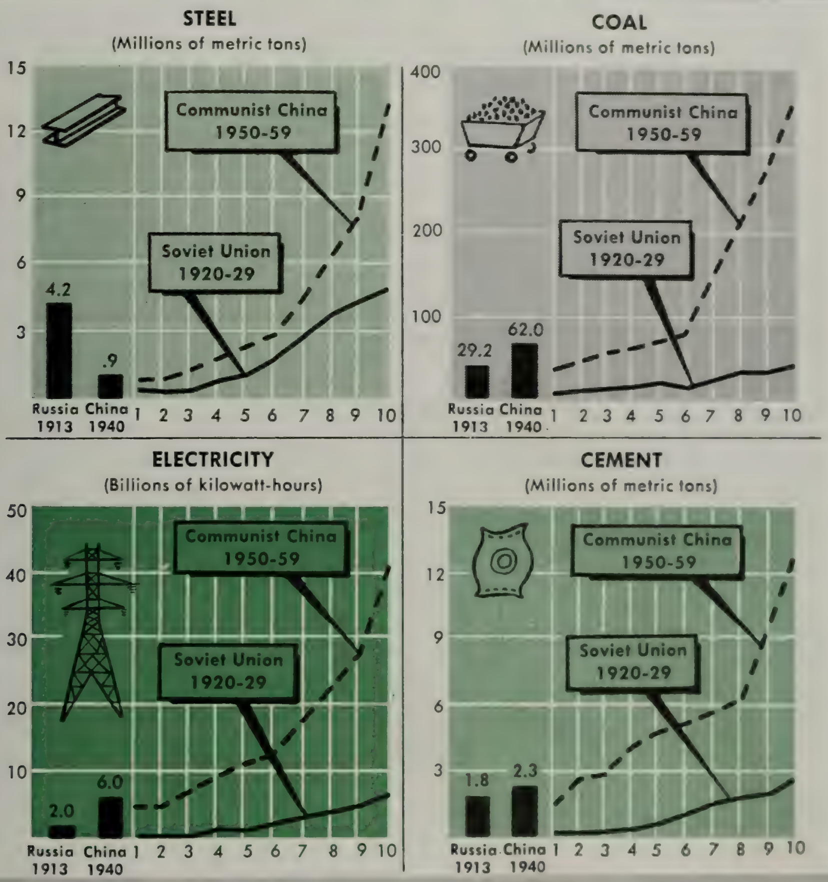
[1] After 1952 "wages and hours" also includes such supplementary benefits as pensions and social-insurance benefits.
[2] Includes disputes over job security, management policies, shop practices and so forth.
[3] Includes stoppages caused by union rivalry, jurisdiction disputes or sympathy strikes.

SOURCE, ALL TABLES: Bureau of Labor Statistics

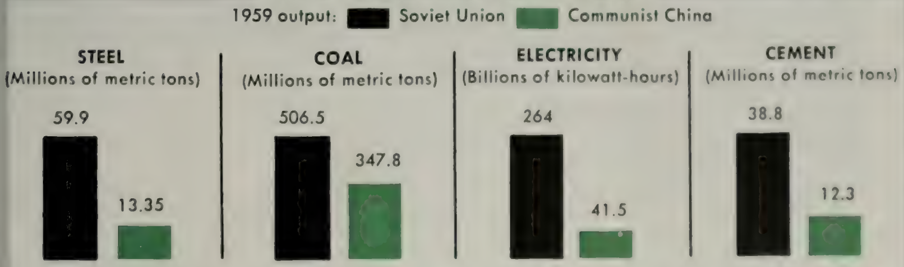
CHINA'S GROWTH AND THE EARLY SOVIET RATE

In each of the four top charts, bars at the left show pre-Communist production peaks in Russia and China. Graphs follow the progress in each country during its first ten years under Communism. The chart below compares 1959 production in the two countries.

THE FIRST TEN YEARS



THE COMPARISON NOW



Communist China had a faster rate of early growth than the Soviet Union because of help from other Communist regimes, rapid imposition of tight discipline, a much larger work force and present-day advanced technology.

Source: *The New York Times*

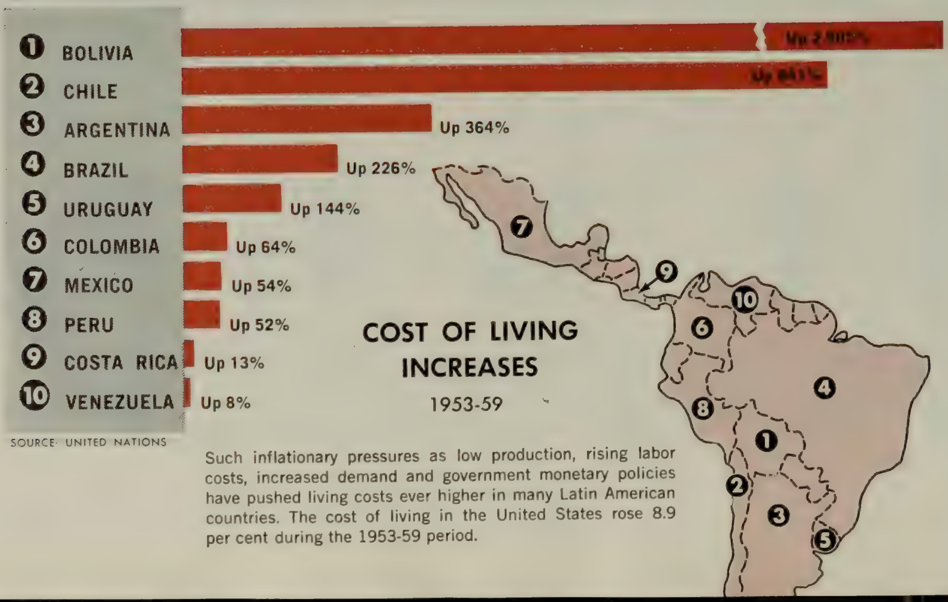
THE ECONOMY OF LATIN AMERICA

Latin American countries have been caught in an economic squeeze because of rising costs of imported manufactured goods and declining prices for their basic export products. Some nations are dependent principally on a single export commodity—such as coffee in Colombia, Guatemala and El Salvador, copper in Chile and oil in Venezuela—and any decline in the world price seriously affects their internal economies. At an Inter-American Economic Conference in Bogota, Colombia, in September 1960, delegates stressed industrialization, regional common-market activities and the acceleration of both social and economic development as means to meet the problems of declining prices and declining markets for Latin American commodities.

SOME MAJOR EXPORT COMMODITIES AND WORLD TRADE: 1957

COUNTRY AND COMMODITIES	PER CENT OF COUNTRY'S EXPORTS	PER CENT OF WORLD'S EXPORTS
ARGENTINA		
Beef	26	57
Wheat	16	10
Wool	12	7
Remaining products exported	*46*	—
BRAZIL		
Coffee	61	40
Cacao	5	18
Remaining products exported	*34*	—
COLOMBIA		
Coffee	75	19
Remaining products exported	*25*	—
CUBA		
Sugar	81	47
Remaining products exported	*19*	—
DOMINICAN REPUBLIC		
Sugar	55	6
Remaining products exported	*45*	—
HONDURAS REPUBLIC		
Bananas	52	24
Remaining products exported	*48*	—
URUGUAY		
Wool	50	4
Linseed oil	5	9
Remaining products exported	*45*	—
VENEZUELA		
Crude oil	92	40
Remaining products exported	*8*	—

SOURCE: International Monetary Fund



SOURCE: UNITED NATIONS

COST OF LIVING INCREASES

1953-59

Such inflationary pressures as low production, rising labor costs, increased demand and government monetary policies have pushed living costs ever higher in many Latin American countries. The cost of living in the United States rose 8.9 per cent during the 1953-59 period.

PRICES

The world's price structure has not favored the sixteen products that form 80 per cent of Latin American exports. In recent years the price that Latin American countries have been able to demand for their products has declined. At the same time the price that they have had to pay for imports has risen. In the following price-index table, 1953 = 100.

	1951	1953	1955	1957	1959
Latin American exports	108	100	101	101	90
Latin American imports	103	100	100	107	105

SOURCE: International Monetary Fund

PRICES OF MAJOR LATIN AMERICAN TRADE COMMODITIES

(Expressed in United States dollars)

	1953	1955	1957	1959
Bananas, retail in New York (100 pounds)	15.30	15.50	16.20	15.70
Argentine beef, frozen (100 pounds)	20.37	19.30	14.65	19.19
Colombian coffee, in New York (100 pounds)	60.02	64.42	63.94	45.22
Chilean nitrate, in the United States (ton)	55.70	51.20	48.90	48.70
Venezuelan petroleum (barrel)	2.76	2.87	3.04	2.84
Cuban sugar, other than in the United States (100 pounds)	3.41	3.24	5.16	2.97
Uruguayan wool (100 pounds)	70.30	63.00	66.80	42.10

SOURCE: International Monetary Fund

LATIN AMERICA'S TRADE

COUNTRY OR REGION	LATIN AMERICAN IMPORTS		LATIN AMERICAN EXPORTS	
United States	$3,495,700,000		$3,677,000,000	
Continental Western Europe	1,908,500,000		1,672,200,000	
European Common Market countries		$1,506,900,000		$1,416,200,000
Latin America [1]	689,500,000		689,500,000	
Japan	224,300,000		254,300,000	
Canada	182,400,000		137,400,000	
Sterling area, TOTAL	618,400,000		876,600,000	
Great Britain		432,000,000		736,000,000
Burma, Ceylon, India and Pakistan		47,600,000		14,400,000
Middle East Sterling		29,000,000		1,500,000
Australia, New Zealand, Federation of Rhodesia and Nyasaland, and South Africa		27,800,000		21,300,000
Iceland and Ireland		3,000,000		12,200,000
Other Sterling		79,000,000		91,200,000
Overseas associates of Continental Western Europe	152,400,000		604,600,000	
Soviet Union and Eastern European satellites	134,000,000		150,400,000	
Finland, Spain and Yugoslavia	94,400,000		104,500,000	
Other Middle East	22,900,000		25,900,000	
Communist China, Mongolia, North Korea and North Vietnam	2,500,000		2,300,000	
Other Far East	13,400,000		13,300,000	
WORLD TOTAL [2]	7,550,000,000		8,221,500,000	

[1] Trade between Latin American countries.

[2] Includes certain exports and imports that, because their destinations could not be determined, are not included elsewhere in the table.

SOURCE: United Nations

STANDARD OIL
CANADIAN NATIONAL FILM BOARD
ABBOTT LABORATORIES
RCA
INTERNATIONAL HARVESTER

SCIENCE IN OUR TIME

AGRICULTURE

Turf-Grass Culture
Ralph E. Engel 214

ASTRONOMY

Voices from Other Worlds
George A. W. Boehm 217

ATMOSPHERE

The Earth's Atmosphere and Beyond
Sydney Chapman 220

BIOLOGY

Virus Breakthrough
Elizabeth Rubin 223

CONSERVATION

Water-Pollution Control
Gordon E. McCallum 226

GEOLOGY

Tsunamis: Terror in the Pacific
Alexander Johnston 229

HEALTH AND MEDICINE

Studies toward a Longer Life
Henry S. Simms 232
What Do You Weigh?
Cecil J. North 235

METEOROLOGY

Meteorology Enters the Space Age
David S. Johnson 237

ORNITHOLOGY

Bird Flight 242

PHYSICS

The Uses of Extreme Cold
Roland W. Schmitt 246
The Promise of Thermoplastic Tape
Norton Russell 249
The Wankel Rotating Combustion Engine
Diana Bartley 252

SPACE

The Year in Space
James J. Haggerty, Jr. 257
The Missile Gap
Garrett Underhill 263

SCIENCE HIGHLIGHTS

Lise Meitner
Elizabeth von Eschtruth-Werner 268
Science Highlights in 1960
Watson Davis 270

FACTS AND FIGURES

Satellites at Work 278
Building Blocks of Nature 280
Atomic Energy:
The Modern Power Source 281
Mental Illness in the United States 282
Less Food, More Nutrition 284
The Fight against Malaria 286
Prizes and Awards: Science 287

Turf-Grass Culture

By RALPH E. ENGEL

Professor of Turf-Grass Management
NEW JERSEY AGRICULTURAL EXPERIMENT STATION
RUTGERS UNIVERSITY

THE twentieth century has seen the rapid rise of the science of turf-grass culture. Grass is the main component of turf, which is made up also of other small plants and roots and is sometimes called sod. There are few sights more beguiling or restful to the eye than a stretch of lawn beautifully maintained, but grass also has many very practical uses. It protects soil against erosion and therefore makes a good lawn cover an item of the greatest value. With the vast increase in the number of highways stretching cross-country the need for turf to cover and hold the roadsides has also increased. Another great value of grass is that it improves the quality of the soil beneath it, in proportion, of course, to the amount of care lavished upon the turf itself.

Grass also is useful as the "cushion" for many sports. Thick, well-kept turf is valuable not only in reducing injury in such contact sports as football and soccer but also is the essential background in golf and lawn tennis, among other sports. The National Playing Fields Association of England recommends that to insure adequate communal playing facilities there must be a minimum of six acres of publicly and permanently owned playing fields for each 1,000 of the population. Many areas fall far short of this acreage; the situation is obviously difficult to correct once a region has become heavily settled. Man's demands for preserved sports areas will mount as time goes on, particularly in view of increased leisure time for sports.

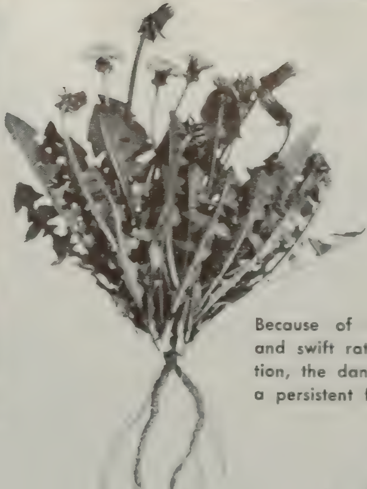
The art of turf maintenance is one of the oldest of the arts and has been greatly aided in modern times by the advent of the power mower. No one knows, because there are no exact figures available, just how much money and time are spent each year in turf-grass culture. Whatever surveys have been made show that the amount of money spent on turf improvement generally is very impressive and that work being done in this field is one of the big agricultural enterprises of North America. The science embraces the knowledge of the fundamentals of grass behavior in relation to diverse combinations of climate and moisture, soil fertility and mowing practices. Numerous kinds of grasses are used and each species reacts in its own way to growing conditions. The specialist in this field must have expert knowledge of botany, plant physiology, ecology (which deals with the mutual relations between organisms and their environment), plant pathology, soil science, entomology (the study of insects), chemistry and other related subjects.

What general rules can be given for improving and maintaining the quality of a lawn? It is extremely difficult to give one set of rules that will apply equally well to the culture of turf grass under widely varying conditions. Indeed, it is impossible. There are, however, certain practices that can be safely followed in most areas.

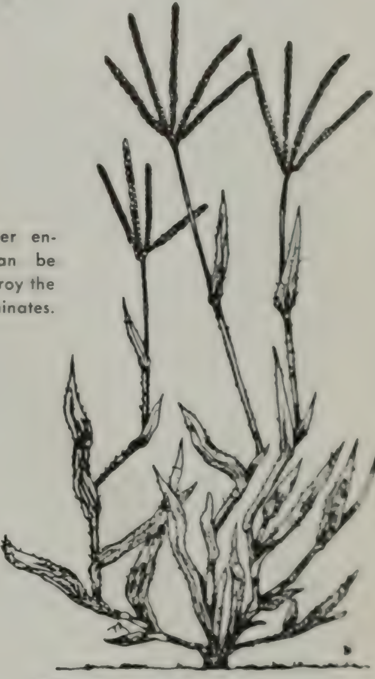
As most people will realize, it is easiest to make a good lawn with good topsoil.

PHOTOS, J. HORACE MCFARLAND

The pleasing results of wise turf maintenance: a smooth sweep of green lawn without bare patches.



Because of its long roots and swift rate of reproduction, the dandelion plant is a persistent foe of grass.



Crab grass is another enemy. A chemical can be used, however, to destroy the plant before it germinates.

DRAWINGS RUTGERS UNIVERSITY

The weed called plantain, if left to flourish, forms unsightly clumps, marring the appearance of what should be smooth turf.

If this is impossible to obtain, a good lawn may still be had by the proper use of lime and fertilizer and seed, provided constant care is used in maintaining the lawn. The most satisfactory method of learning about the details of lawn culture in your own area is to consult a reputable turf grower in your neighborhood and to get in touch with your county agricultural agent for advice. Also, pay strict attention to the directions on the packages of seed and fertilizer that you buy.

Proper drainage must be provided at the start so that your lawn does not become soggy and waterlogged. Lime is necessary in many areas; it decreases the acidity of the soil and aids plant growth by supplying calcium and magnesium. You will know what your soil needs, however, only after it has been tested for acidity. This can be done by laboratories or with small kits. Tests by laboratories can help also in determining the kind of fertilizer you will use. The perfect fertilizer contains three elements—nitrogen, phosphorus and potassium—but these are combined in different percentages for different types of soils. Usually the bluegrass lawn needs to be fertilized only twice a year, in the early spring and again, preferably, in September. If the soil is very sandy, it may require more than this. The Bermuda-grass lawn is fertilized in spring and summer at heavier rates.

Now, as to the types of grass seed to use. Because conditions of soil and climate vary so widely, again the most satisfactory method of procedure is to consult your county agent or your reliable seedsman. One thing is certain: it is never sensible or economical to buy the cheapest mixture of grass seed, because some of the components may produce only temporary turf. Choice of the correct grass is critical and should be made in view of such conditions as purpose, soil fertility, light and so on. Kentucky bluegrass is the most common lawn grass in the northern United States and Bermuda grass has served similarly well in the southern United States. Bent grasses are the aristocrats of the golf greens. The zoysias are warm-season grasses introduced from the Orient and are grown in the warmer regions of the United States. *Zoysia japonica,* especially the selection Meyer Zoysia, is used in the middle latitudes. The main advantage of these grasses is tolerance to close cut, heat and low fertility. Kentucky bluegrass prefers good light and well-drained, fertile soils; it dislikes close mowing and high summer temperatures. Merion Kentucky bluegrass is the best of the Kentucky bluegrasses.

Common Bermuda grass is the most widely distributed of the Bermuda grasses in the southern United States. U3 and Tiflawn are improved types of medium texture. The Bermuda grasses require sunlight and higher growing temperatures, respond well to nitrogen fertilizer and give their best turf when cut at the closer heights of one inch or less. Like Zoysia, the Bermuda grasses lose all green color in freezing weather.

In the actual care and improvement of turf grass, mowing or cutting is an essential feature. Mowing serves the purpose of creating uniform-length shoots. This uniformity improves the appearance as well as the quality of the turf, and controls the growth of weeds also. As a general rule, most Kentucky grasses should ordinarily not be cut shorter than 1½ inches, and during the summer a height of 2½ inches is recommended. At certain times of the year, when the grass grows most rapidly, as in the spring, it may be necessary to mow every four or five days; at other times, less often. It may be well to mention that a new lawn should be mowed for the first time when the grass has reached a height of 3 to 4 inches and should be cut to not less than 1½ inches.

Natural rainfall should be supplemented in many regions, even in some humid climates. Under very dry conditions, watering may be absolutely necessary to sustain the life of the grass, but excessive use encourages weeds, disease and compacting of the soil. You will not need to water your lawn until the grass is somewhat wilted and limp-looking, with a bluish look rather than a bright green color. The water should dampen the soil down as much as six inches. If a drought occurs it is better to water your lawn well every five to ten days than to use smaller amounts of water constantly.

Grass can be very persistent in its growth but it does require protection from disease and insect attacks. Mercury fungicides have been most used for disease control and chlorinated hydrocarbons for the control of insect pests. Through research with herbicides, we now have 2,4-D for control of dandelions, buckhorn and plantain, with comparative safety to the turf grasses.

Advances in knowledge of soil-acidity control, fertilization, watering and fungicides have helped avoid serious hot-weather loss of Kentucky bluegrass, red fescue and bent grasses. In the humid regions, ground limestone is often applied to correct soil acidity; this has been highly beneficial. In some low-rainfall areas excessively alkaline soils receive fertilizers or chemicals that are acid-forming as an aid to turf grass production.

The greatest single breakthrough in research in the field appears to be what is known as pre-emergence crab-grass control. This technique involves application of a chemical before crab grass germinates, to destroy the plant as it develops from the seed. Common names of the chemicals used in this experimental work are calcium arsenate, chlordane, dacthal and zytron. More years of research are required; however, before the best use of these chemicals is possible.

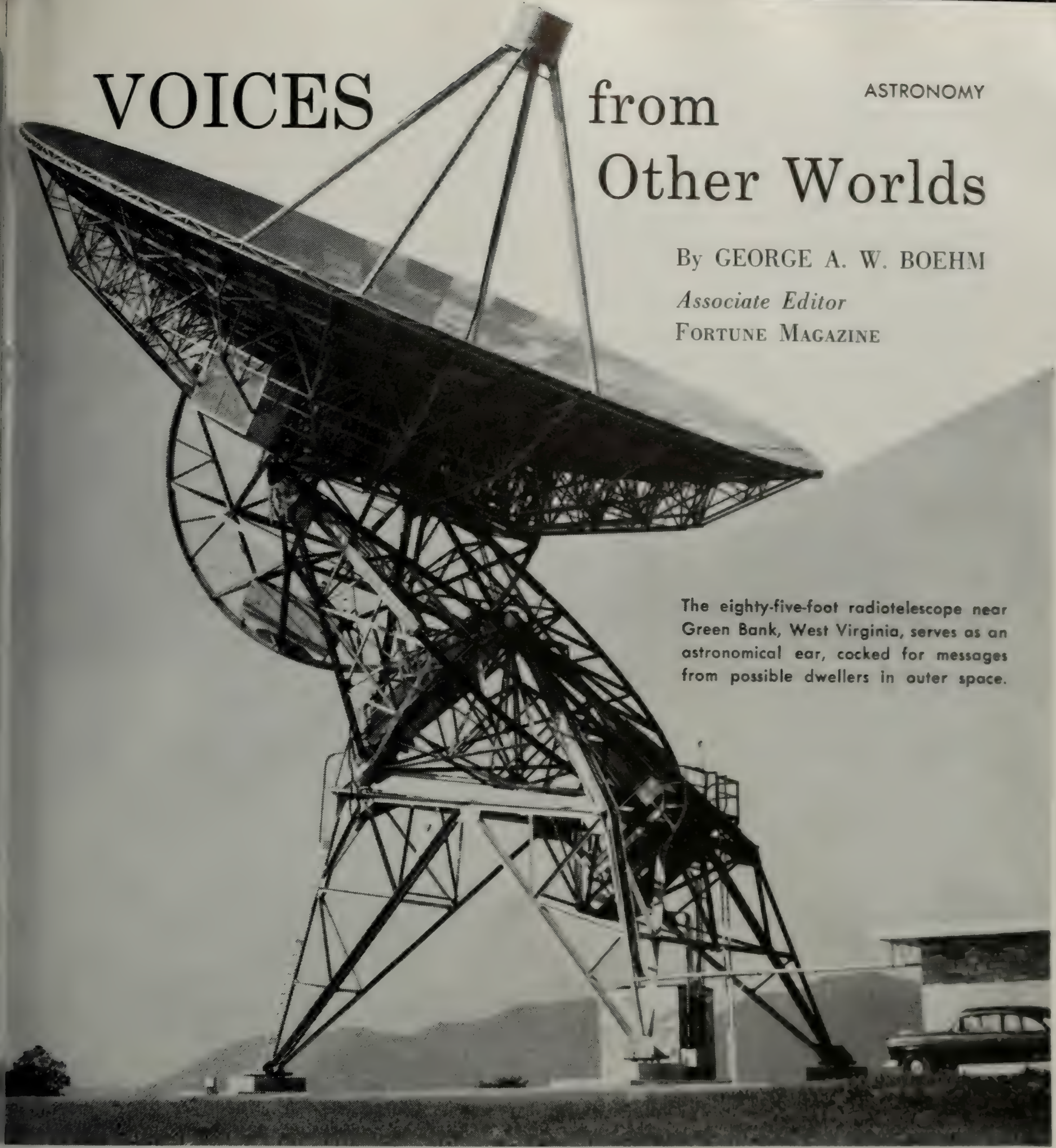
ASTRONOMY

VOICES from Other Worlds

By GEORGE A. W. BOEHM

Associate Editor

FORTUNE MAGAZINE



The eighty-five-foot radiotelescope near Green Bank, West Virginia, serves as an astronomical ear, cocked for messages from possible dwellers in outer space.

IS man the only intelligent being in the universe? Or are there living beings on other planets who have learned to speak, write books, paint pictures, play music, build machines and discover the laws of science? Philosophers have speculated about such questions for centuries, with little hope of finding answers. But now that the exploration of outer space is under way, the questions have suddenly become more urgent. If we do indeed have distant neighbors, it seems possible that we may encounter them sooner or later.

Almost certainly nearby space is devoid of beings as intelligent as man. None of the other planets that circle the sun can support higher forms of life. They are either too hot or too cold or they lack the right kind of atmosphere. To find other highly developed forms of life we shall have to go at least as far as the nearest stars beyond the sun—an incredible distance of some 25,000,000,000,000 miles. It may be a century or more before a rocket ship ranges beyond the solar system, but there is, nevertheless, a chance that we may be able to communicate with other beings in space within a very few years.

Last April in a quiet valley near Green Bank, West Virginia, a young staff scientist at the National Science Foundation's National Radio Astronomy Observatory began listening for messages from other worlds. Dr. Frank D. Drake pointed a radiotelescope at some relatively nearby stars. Its gigantic antenna, a metal dish eighty-five feet in diameter, picked up feeble radio waves from space; a recording instrument then translated the signals into wiggling lines scribbled on graph paper. The tracing of the recording pen revealed plenty of radio signals emanating from space. Drake's problem was to unscramble this bewildering mixture of signals and to discover whether any part of it might possibly be an intelligent message radioed to earth from some remote point in space.

The research being done by Drake and his team of astronomers is the heart of a well-thought-out scientific program, which has been called Project Ozma after the queen of the mythical Land of Oz (from L. Frank Baum's Oz books). This is a continuing study formally inaugurated with a concentrated month-long schedule of daily observation. Before the radio listening began, scientists had devoted a great deal of effort to planning the project. As a result, Drake had some definite ideas as to where to point the radiotelescope, what kinds of messages to look for and how to decipher them.

Many scientists are convinced that the universe contains other worlds like our own, populated by races of beings fully as intelligent as man. From what astronomers know about the way stars are born, it seems certain that there are many other planets outside the solar system. According to modern theory, stars are formed from turbulent clouds of cosmic dust and gas. Gravity makes these whirling clouds contract. As they get smaller they whirl faster and faster until they finally fly apart. In some cases this disruption gives birth to two or more glowing, incandescent stars that orbit around each other. But in many instances masses of gas and dust break off, cool and condense and then begin circling the newborn stars as the earth circles the sun. Estimates vary but some astronomers suppose that in the Milky Way Galaxy, the great lens-shaped system of perhaps 100,000,000,000 stars of which the sun is one, there may be 100,000,000,000 planets. Because of the vast distances to the stars around which they would revolve, these planets would be invisible through even the most powerful telescope.

Not all of these planets could be suitable homes for living things. Some approach their stars so closely that their surface temperatures would broil any form of plant or animal life. Others are so remote from any source of heat that they are permanently frozen, like the outer planets of our own solar system. Still others may have long, cigar-shaped orbits; they may be alternately too hot and too cold. But undoubtedly somewhere in the Galaxy there are planets that have about the same temperature and probably the same type of atmosphere as the earth.

On such planets, life may conceivably have evolved as it has on earth. Man—or, for that matter, even the simplest single-celled organism—is an extraordinarily complex biological machine. But there is no reason to doubt that simple chemical elements on a suitable planet, given enough time and proper surroundings, could combine to form the kinds of matter that we find in living things on earth. Given millions, perhaps billions, of planets where conditions are suitable for life, the whole history of evolution as we know it may well have been duplicated thousands of times in other parts of the universe.

If intelligent beings on other planets are trying to communicate with us by radio, what kind of messages might they be sending? If they are truly intelligent they are using a code designed to be easily broken.

There is good reason to suspect that they would transmit on a wave length of about twenty-one centimeters. Radio astronomers on earth have found that hydrogen gas, the commonest material in the universe, emits radio waves that are about twenty-one centimeters long. In fact by tuning their radiotelescopes to this wave length, as you would tune a radio receiver, they have been able to discover much about the structure of the universe. Presumably any other beings intelligent enough to attempt interstellar broadcasts would realize that radiotelescopes on other planets might be tuned to the wave length of hydrogen.

They would be likely also to code their messages in the simplest possible cipher: a code with only two symbols, such as the dot and dash that telegraphers use. And they would send out repeated signals so that their message would have a recognizable pattern. This is just what Drake is looking for, a regular sequence of dots and dashes repeated at intervals. If he finds such a sequence he will be reasonably sure that some beings out in space are trying to get in touch with us.

But even if he detected a pattern that seemed to be a message, the meaning still would have to be deciphered. This might not be as difficult as it sounds. In making every attempt to insure that their message would be clearly understood, the senders probably would stick to subjects that all beings, everywhere in the universe, would understand. Just as we could hardly expect them to understand about baseball, movie stars or the geography of South America, so they would not bother to send us messages about the local concerns of their own planet. Instead they might start by broadcasting whole numbers: "1, 2, 3, 4, 5, 6." After repeating this a few times, they might try broadcasting prime numbers—that is, numbers that are not evenly divisible by other numbers (except number 1), such as 2, 3, 5, 7, 11 and 13. If they were clever enough in devising a code and we were clever enough in deciphering it, they could eventually use the numbers to describe an alphabet and a language.

Actually it would be much easier if they could send television signals. They could teach us their language rather quickly by pointing to objects and naming them. It might be extremely difficult to get a clear picture on a television screen on earth, but Drake thinks he could recognize a television signal by pulses used to synchronize the picture.

Two-way communication between earth and another planet would lead to much more rapid understanding, for it would enable the two races of beings to ask each other questions. But this would require unlimited patience. While radio waves travel at about 186,000 miles per second (the speed of light), the stars beyond the sun are so remote that it would take a signal from the earth more than four years to reach the nearest one. Thus, if a question were asked today, an answer could not be expected in less than eight or nine years.

Most scientists agree, from their extensive knowledge of the solar system and the stars, that the existence of intelligent beings on other planets is probable. Scientists can only conjecture as to how highly civilization may have been developed in other worlds.

Some scientists seriously question whether, if we do detect messages, we should try to establish two-way communication. They reason that if there are other beings who have developed technology to the stage where they can begin interstellar broadcasting, they may be much more advanced in science than we are. After all, modern science on earth dates back only two or three centuries, and radio was not invented until within the past hundred years. Our technology covers but an instant in the history of evolution. Any other race that has mastered radio may have progressed much further. If we should answer their radio signals, we would inevitably reveal our position in the universe.

It would be fascinating to share ideas with other intelligent beings that may be much wiser than man in many ways. But dare we expose ourselves to a race that might be overwhelmingly powerful? Someday man may have to choose between curiosity and prudence.

The EARTH'S ATMOSPHERE and BEYOND

By SYDNEY CHAPMAN

High Altitude Observatory

THE atmosphere, the layer of air that rests on the land and the seas, envelops the globe. It is vitally important to every one of us, for we must breathe the air in order to live. Most of our food depends on the rain that falls from the atmosphere, and our activities are greatly affected by the weather. Consequently, it is natural that men should intently study the atmosphere.

Instruments of many kinds have been devised for this purpose. The simplest and probably the first to be used is the wind vane, which merely gives the direction of the air motion. Anemometers and wind-pressure gauges to measure the speed and force of air movement came much later. Air temperature and air pressure are measured by the thermometer and the barometer.

During the International Geophysical Year (1957–58), these and many other instruments were used more extensively than ever before to increase our knowledge of weather and climate. The network of observing stations at ground level was greatly enlarged. The atmosphere was explored "in depth," and the immense mass of atmospheric information collected during the IGY is now being studied by meteorologists. The results will increase our knowledge and understanding of the general circulation of the air and of the jet streams, as well as of the growth and decay of cyclones and hurricanes. We may expect that our increased knowledge will also improve our ability to foretell the weather.

The atmosphere up to 100,000 feet was investigated by instruments carried in balloons that, drifting with the air, were tracked by radar. From the information thus obtained, scientists were able to determine the direction and speed of the wind at different levels.

To explore above the reach of balloons, many rockets of various kinds were launched. They carried special measuring devices to determine the temperature, pressure, density and composition of the upper air, the speed and direction of the winds at such high levels and the incidence of cosmic rays. Some of these rockets traveled to heights of 200 miles or more; in most cases their flight was very brief, lasting only a few minutes. Speeding through the air, they measured its properties, and the results were immediately transmitted to the ground by radio signals. These "sounding" rockets were launched from many places over a wide range of latitude—from the Arctic to the Antarctic.

They revealed many important facts about the nature and state of the upper atmosphere. Many more such flights will be needed, however, before we can know how typical are the results obtained. This is true also of the samplings made of the "weather" that exists far above the ground, up to and within the ionosphere. (The ionosphere, which lies above the stratosphere, begins about forty-five miles above the surface of the earth.)

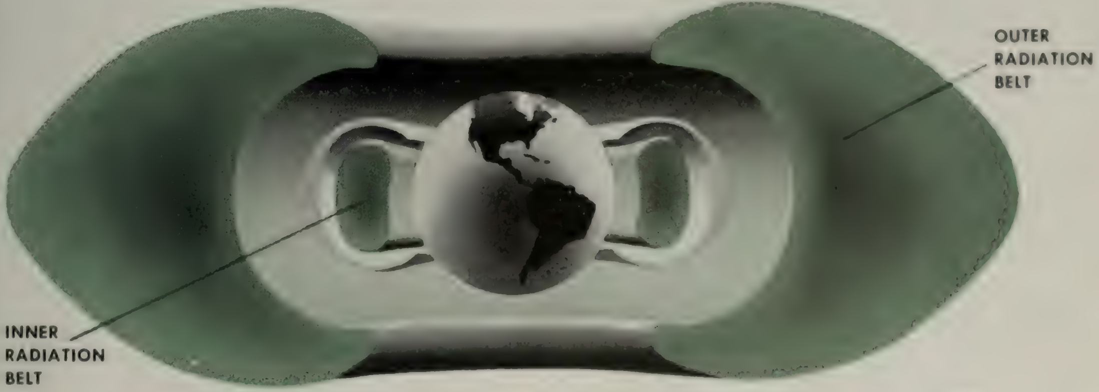
The IGY inspired still more revolutionary devices for the study of the atmosphere and the space beyond. These are the artificial earth satellites, which were later followed by the "cosmic" rockets, so called because they penetrate deeply into the space around the earth, to or beyond the moon. They can stay aloft for days, weeks or even longer, as can the satellites if they are launched into regions where the air is thin enough to offer sufficiently little resistance.

The satellites have an advantage over the sounding rockets in that they can, as they move in their orbits, explore and measure the atmosphere above many parts of the earth and over a long interval of time. Their measurements are transmitted to the ground by radio signals as long as their batteries continue to supply the necessary power. The most recent satellites and cosmic rockets have devices for replenishing the batteries by solar energy. The motions of the satellites themselves, as tracked by radar, give valuable information about air density and also about the earth's form and its distribution of mass. The great propulsive force needed to put satellites into orbit had to be further increased to launch cosmic rockets. Some of these rockets remained under the control of the earth's gravitational attraction and, after traveling far away, they returned. But some of them attained a speed great enough to escape altogether from the earth's pull. They may be captured by the gravitational pull of, say, the sun or of some other planet than the earth. Rockets may even be purposely launched in such a way as to approach some other celestial body. One sputnik, for example, obtained photographs of the part of the moon's surface that is forever turned away from the earth.

In the ionosphere there are countless atoms and molecules that have had electrons stripped from them, leaving positively charged ions, a process that requires a supply of energy. This may be provided by the sun's ultraviolet radiation, in which case all the energy is absorbed far above the ground. Or it may be provided by the impact of material objects, such as meteors, or particles of the streams and clouds of gas ejected from the sun by violent storms at its surface. The most intensely ionized part of the normal daytime ionosphere is called the F2 layer. At its peak level—about 200 miles above the ground—each cubic inch of air contains as many as 15,000,000 free electrons, with an equal number of positively charged ions, either atomic or molecular. Radio physicists can explore the ionosphere up to the F2 peak by means of signals sent up from the ground. Satellites have indicated the state of the ionosphere at still higher levels. They have shown that the electron density diminishes upward more slowly than had been thought.

The satellites have also shown us that there is more air above the F2 peak than was previously realized. This probably means that the air temperature continues to increase upward above the considerable value found at the F2 peak, which seems to be of order 2,500° Fahrenheit. From the satellites we have learned also that above 150 miles the air temperature varies considerably from day to night. At those heights the air expands upward by day and cools and descends at night.

The most remarkable discovery resulting from satellite information is the presence of two great radiation belts far above the earth's surface. We have also learned much more about these belts from the cosmic rockets. They are known as the Van Allen belts, from their prime explorer, Dr. James A. Van Allen, pro-



fessor of physics at the State University of Iowa. The radiation that distinguishes them consists of small, charged particles, mainly protons and electrons, with high speed and energy. Such particles constitute a danger to space travelers somewhat like that to which early workers in medical radiography fell victim, or those that have to be guarded against in nuclear-energy plants or laboratories. The problem in such cases is solved by heavy screening of the danger spots. It may be necessary also to screen space vehicles heavily, but if so the screening may add greatly to the mass that will have to be launched with the space travelers. There is another possibility, however, since the radiation belts do not altogether surround the earth. Travelers to interplanetary space might make their exit through the gaps that exist in the belt around the poles of the earth's magnetic axis. They might, however, meet similar hazards, not yet predictable in space beyond the belts.

The two radiation belts are decidedly different from one another. The inner one, which has the more energetic particles, is fed mainly from below, by particles coming from the lower atmosphere. In this region some of the cosmic rays collide closely and violently with the nuclei of atoms of the air molecules. These collisions break up the nuclei, and in some cases neutrons are ejected with high speed and energy. These neutrons are particles of mass similar to that of hydrogen atoms or their nuclei, protons. The neutrons have no electric charge and therefore they can pass through matter much more freely than can charged particles or atoms and molecules. Some of the neutrons fly upward and attain heights of about 2,000 miles. As they have no electric charge, their motion is uninfluenced by the earth's magnetic field, but they are unstable and break up spontaneously, after a short time, into a proton and an electron. These, being charged, are trapped in the magnetic field. The speed and free life of the neutrons are the properties that determine the position of the inner belt.

The outer belt is far more extensive, has more particles and is more variable. It encloses the middle belt of the earth more completely than does the smaller inner belt. The positions of the two are shown in the figure presented herewith. On the whole, the energy of the average particle is less in the outer than in the inner belt. The general opinion is that this main outer belt is fed by gas ejected from the sun, but it is not yet clear how the particles become trapped by the magnetic field of the earth.

In both belts the charged particles spiral around the earth's lines of magnetic force. They travel between high latitudes, continually crossing the equator northward and southward. In high latitudes they approach the earth's surface most closely, and then their motion in latitude becomes reversed. They also drift around the earth, the positive particles westward and the electrons eastward. As a result, a westward electric current is associated with the belts; this affects the magnetic field of the earth.

Since the radiation belts must be considered part of the earth and its atmosphere, they greatly enlarge our conception of the earth's total size. The outer limit of the main belt is about ten earth-radii from the earth's center. Even at such distances there is doubtless a background of "normal" atmosphere, in which the belts are embedded.

The composition of the outermost parts of the earth's atmosphere, however, is quite different from that near the ground, where it is composed mainly of nitrogen and oxygen. Atomic hydrogen is the main constituent at the borders of our atmosphere. Because of the very small mass of hydrogen atoms, the density of the air there falls off very slowly with increasing height.

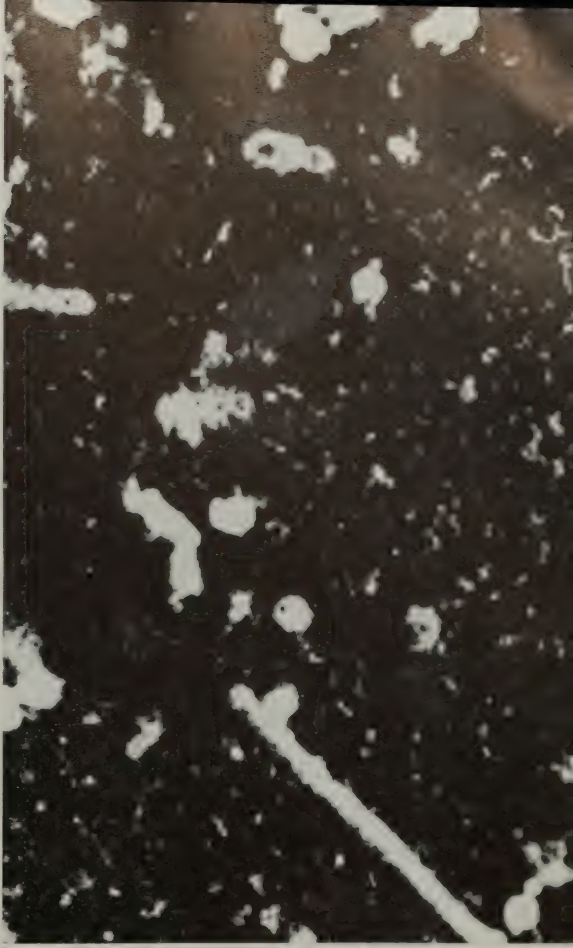
Different views are held as to the temperature of this far part of the "normal" atmosphere. One opinion places it at a few thousand degrees Fahrenheit; another, at 100,000 to 200,000 degrees. If the latter view is correct, our outermost atmosphere must be extremely extensive and may even envelop the moon.

BIOLOGY

VIRUS Breakthrough

By ELIZABETH RUBIN

Researcher and Author



WALTER REED INST

Particles of Asian influenza virus, magnified 27,000 times under an electron microscope, appear as more-or-less spherical blobs. The long object shown at the bottom of the photograph is one type of bacterium.

THE year 1960 saw several important breakthroughs in the war of science against virus infections. For a number of years reliable vaccines and drugs have been available that combat diseases caused by other organisms such as bacteria and rickettsiae (microorganisms found in typhus and trench fever). However, relatively few vaccines and no drugs are available against viral diseases, and for good reason. These little disease agents are the most difficult of all to pin down for study and for the cultivation of vaccines. Most of the information we have about them has been learned since 1940.

Among the virus diseases for which we have vaccines are smallpox, yellow fever, polio, some influenzas, rabies and measles. Other diseases, caused by viruses and for which there are no vaccines, are infectious mononucleosis, hepatitis, encephalitis, chicken pox and mumps. Virus is also thought to be a cause of leukemia and cancer.

In 1960 studies were reported that indicate that virus *is* one of the most important factors in causing leukemia. This disease, always fatal, is a kind of cancerous condition of the blood-forming tissues of the body in which there is a wild overproduction of white blood cells. The disease has become more and more widespread during the past twenty years, for causes not yet completely understood. Twelve thousand Americans die of leukemia every year.

It was already known that some people seem to inherit a predisposition to leukemia. Certain chemicals, X rays, radiation and hormones are known to encourage its development. A number of investigators thought that a virus might be the infecting organism causing the disease, given the proper conditions of inherited sensitivity or chemical encouragement.

However, it remained for Dr. Steven O. Schwartz to carry out the studies that definitely pointed in that direction. Dr. Schwartz took a cell-free extract from the brains of people who had died of leukemia. (Removing all cells from the extract eliminated the possibility of cellular agents being responsible for the test results.) Electron-microscope examination of the extract showed that virus material was present. First, Dr. Schwartz injected mice with the fluid. They developed leukemia and died. Then he injected human volunteers with the extract. Antibodies were produced in the volunteers' bodies against the agent. When a person is infected with a virus or other foreign material, his body makes antibodies. These are substances that patrol the blood stream and protect the person against any subsequent infection by that virus or material. When blood serum containing the antileukemia antibodies was taken from the volunteers and injected in mice in the early stages of leukemia, they recovered. Others first injected with the antibody-bearing serum and then with leukemia extract failed to develop the disease. Dr. Schwartz feels that these results not only indicate the viral nature of leukemia, but that it will be possible to develop a vaccine against the disease in the future.

Another breakthrough came in researchers' attempts to develop a vaccine to combat influenza. The seriousness of flu infection is shown by the fact that at one time during the winter of 1959–60 nearly 4,000,000 people in the United States alone were estimated to be bedridden because of it. A number of difficult problems faced the developers of the influenza vaccine. The disease can be caused by between sixteen and twenty different identified strains of virus. Yet a vaccine usually protects a person against only one specific strain, and no one is very eager to have fifteen or twenty shots.

Another complication lies in the fact that viruses have an unpredictable habit of developing mutant forms—that is, new virus strains radically different in some ways from the parent virus. If the mutant's characteristics are too different from those of the parent virus, a vaccine against the parent is useless against the mutant. When a mutation, say, of a flu virus occurs, researchers have to develop a completely new vaccine to deal with it. The new form must be isolated, studied and cultivated in laboratories before the vaccine can be developed. All this is laborious and time consuming. Yet, in spite of these tricky problems, American researchers have developed a new vaccine that is effective against the seven most widespread of the present flu-causing virus strains. This vaccine came into use last year and is expected to protect against 75 per cent of the symptoms related to common colds.

Russian scientists have developed another flu vaccine that protects against two of the commonest flu-causing viruses in that country. This vaccine is sprayed directly into the nose.

Last year more facts were chalked up to support the belief that virus plays a role in the cause of cancer. Scientists have found that all viruses consist of two parts: a sack of protein enclosing a nucleic-acid center. The outside of the virus is speckled with enzymes that eat through the wall of whatever cell the virus attaches itself to. (An enzyme is a substance that speeds up chemical changes in the body.) With the cell wall destroyed, the virus is free to enter the cell. Only the nucleic-acid part of the virus goes into the cell.

Nucleic acid is a substance present in the nuclei of all cells, as well as in viruses. This acid serves a special purpose in a cell. Cells are made of proteins which are constantly breaking up and being replaced in the process of living. During division the cell must pass to its daughter cells a coded blueprint to guide them in building their own protein cell structure. Nucleic acid furnishes the pattern that insures the exact reproduction of the protein molecules of which the cells are made. When virus nucleic acid enters a cell, it acts as a pattern for the putting together of proteins in the image of the virus rather than of the parent cell. The virus actually forces the cell to use its own materials to produce more viruses rather than cells. Thus the cell is soon filled with virus nucleic acid and virus protein. By making the cell's genetic material (that material which passes on characteristics from generation to generation) abnormal, the virus causes abnormal characteristics to be passed on to other generations of cells. This information supports the theory of Dr. J. S. Colter of the Wistar Institute in Philadelphia, who feels that cancer characteristics may be heritable.

English scientists have succeeded in tracing the complete life history of viruses of a type known as bacteriophages. Knowing this life history, scientists can learn more about how these organisms attack cells and just what role nucleic acids play in life processes. This in turn may lead to more conclusive evidence implicating virus as a cause of cancer. English scientists also report studies indicating that viruses can cause cancer by throwing the cells' finely balanced regulatory systems out of balance. This results in the rapid multiplication commonly associated with cancerous growths.

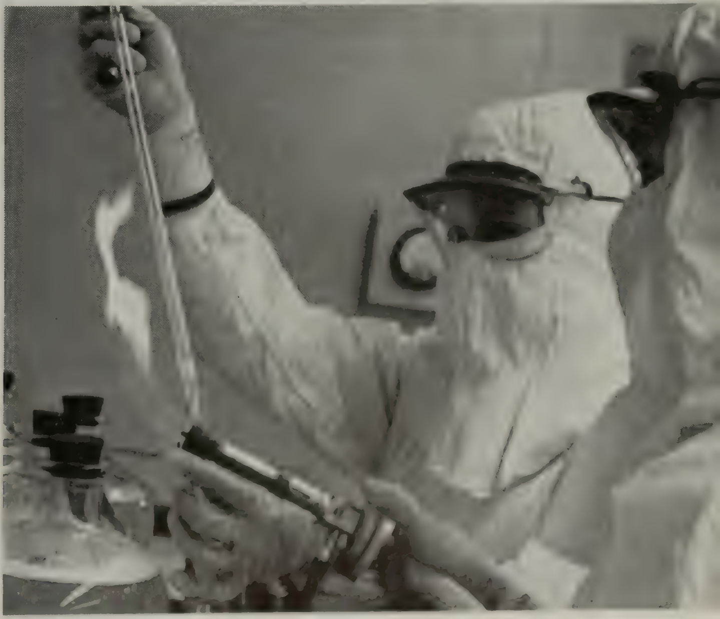
Russian researchers report that they have actually observed globular bodies resembling viruses in cells from cancerous growths. Further follow-up studies are being done to determine whether the bodies are really viruses.

Other important research going on in the virus field includes that of American scientists who are working on a dependable vaccine to combat mumps. The Russians have already announced development of a mumps vaccine.

Scientists have been hopeful that polio, formerly one of the most dreaded virus diseases, was under control because of the widespread use in the United States of the killed-virus vaccine of Dr. Jonas E. Salk. They have been baffled, however, to find that polio has increased in the United States recently. This increase has been especially noticeable in the under-two-years age group. It has been suggested that mutations of the polio virus, resistant to the vaccines developed, may have sprung up. Further research on the problem is being done and new vaccines are being widely tested. A live-virus vaccine developed by Dr. Albert Sabin of the University of Cincinnati has been successfully tested in Russia and is now being tested in the United States. A killed-virus vaccine contains virus that has been treated with chemicals so that it is no longer infectious but can still cause the production of antibodies in the body. A live-virus vaccine contains a specially grown weak mutation of the disease-causing virus. The mutations are not chemically treated, but are too weak to cause the full-blown infection that the parent strain could cause.

While much still remains to be done in this relatively uncharted field of viral-disease control, most researchers feel that they have a toe in the door. With new knowledge being gained every day all over the world, the time may not be far distant when some of man's most distressing infectious diseases will be controllable.

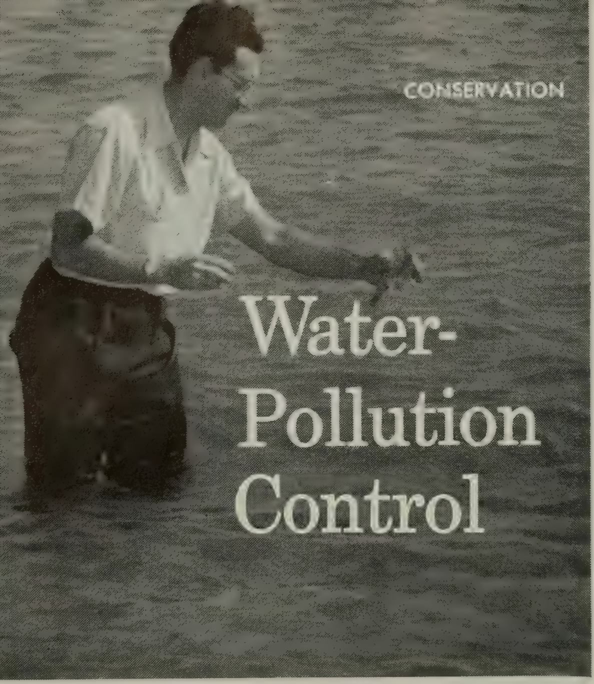
CHAS. PFIZER CO., INC



Technicians make a routine check of a virus-laden fluid as one of the steps toward manufacture of a vaccine against influenza. During the tests, the bottles of fluid are stored at low temperature.

CONSERVATION

Water-Pollution Control



Sampling is the first step in water-pollution control.

CITY OF NEW YORK, DEPARTMENT OF HEALTH

By GORDON E. McCALLUM

Chief, Division of Water Supply and Pollution Control

UNITED STATES PUBLIC HEALTH SERVICE

THE earliest settlers in North America found water in abundance and little dreamed that their descendants might one day face critical water problems. But today, on every hand, we hear disquieting reports of such problems, not only of shortages but of pollution. Most alarming are those problems concerning potential health hazards caused by contaminated waters. Involved also are losses of fish and wildlife, the destruction of natural beauty and recreational areas, to say nothing of depressed real-estate values, along polluted streams.

Increasing amounts of surface waters in the United States are now being made useless by uncontrolled pollution. It is difficult to believe that the nation boasting the world's highest health standards has permitted this to happen.

How did all this come about? The twentieth century has brought phenomenal growth in population, industry and agriculture. Two thirds of the American people now live in cities or urban developments surrounding cities; this same proportion of people once lived on farms. Hundreds of relatively recent types of devices—automatic washing machines, air conditioners, backyard swimming pools, to mention only a few—call for volumes of water not formerly required in the home. When we add to household consumption the amount of water that goes into industrial production, we find, at the beginning of the 1960's, that some 180,000,000 people in the United States are using an estimated 300,000,000,000 gallons of water daily. Most of this water becomes polluted—is turned into liquid wastes that must be disposed of in some manner.

Because of the enormous use of water, as much of these liquid wastes as possible must be made fit to use over again. Water re-use is made possible, first, by adequate treatment of all municipal and industrial wastes before they reach the watercourses into which they empty. Then the streams to some extent purify the liquid wastes as they carry them along. When the water reaches another community, filtration and chemical treatment further purify it for drinking and other purposes. Unfortunately the job of the water-treatment plants is becoming increasingly difficult—to transform the liquid wastes to safe, usable water. The tastes and odors that can be detected even in much heavily treated city water are evidence that cities and industries cannot continue to send their growing volumes of raw or inadequately treated wastes downstream.

In general, pollution comes from three sources—land drainage, municipal waste, and industry. Silt in surface waters results from the washing off of soil from farmlands and new housing and highway developments. (Soil conservationists work constantly at the job of keeping the topsoil on the land where it belongs, a difficult task.) Water pollution is caused also by the domestic sewage from home bathrooms and kitchens, from hospitals, mortuaries, restaurants, hotels and laundries—all the waste that flushes down the drains of a city. Industrial wastes are the acids, chemicals, oils, greases, minerals and animal and vegetable matter cast off by factories, canneries, mines, oil fields, refineries and slaughterhouses.

Since World War II many new products and processes have added their quota of complex wastes to the watercourses. Pollutants such as agricultural insecticides and herbicides, household detergents and wastes from plastic products often do not respond readily to known methods of treatment. Scientists are constantly working to discover methods of separating these new contaminants from the waters. Harmful in varying degrees to fish and other aquatic life, some of these chemical mixtures persist for a long time and build up in surface waters. Even the underground water supply in some areas has become contaminated. Serious health dangers may result from man's prolonged use of such water.

Radioactive substances are also possible sources of water pollution in this nuclear age. In 1959 the wastes of a Colorado uranium mill discharging into the Animas River were found to be carrying radioactive materials downstream into New Mexico. When this was discovered the waste discharge was quickly stopped by co-operative action of the Public Health Service and the two states. Careful analyses of the country's major streams are constantly being made to detect radioactive and other contaminating substances. Since conventional water-treatment plants in use today are not designed to provide protection against such contaminants, these wastes must be treated and controlled at the immediate source.

City, state and Federal administrators are concerned with the various pollution problems now facing the country. Only through the co-operative efforts of people at these three government levels can pollution be fought successfully. Congress demonstrated its latest concern in 1959 when a Senate Select Committee on Water Resources was appointed. This group is studying problems and projecting plans for the nation's fullest and wisest use of water for the next twenty years.

Among the 11,131 American communities with sewers there are some 2,900 that have never provided treatment for their wastes. From these communities the raw sewage of 19,500,000 people goes directly to streams. Another 1,100 communities need new sewage-treatment plants for 3,400,000 persons where treatment works are overloaded or obsolete. In addition there are 1,630 communities where sewage-treatment facilities need enlarging or improving to serve adequately populations totaling more than 25,000,000 people. If municipalities are to catch up with present and sure-to-come needs by 1965, they must spend $600,000,000 a year for sewage-treatment plants.

Comparable figures on industry's waste-treatment needs are lacking at present, but will no doubt parallel or exceed municipal needs. Of the approximately 280,000 manufacturing establishments in the United States, more than 150,000 use significant amounts of water and hence must dispose of substantial amounts of liquid wastes. Of the total number of factories, all but about 25,000 discharge their wastes to municipal sewer systems. The Public Health Service estimates that the pollution discharged direct to watercourses from these 25,000 plants is far more in total volume and concentration than are the wastes from all the industries discharging to municipal systems.

Some industrial wastes have far worse contaminating effects than others. Wastes from pulp and paper mills (1953 daily average) were found to be equal to those from a population of 43,600,000 people. Also rating high, in the order named, were the polluting effects from the following industrial processes: fermentation (alcohol, beer, wine, yeast, antibiotics), sugar refining, slaughtering and meat packing, textile manufacture and dyeing, food canning and freezing, petroleum refining, and synthetic-rubber, tannery, soap and fat processing.

Antipollution measures are making gains, very substantial in some industries, but for the most part slow. For example, restoration of the Ohio River, under way since 1948, still is not complete. Pollution continues to ride the currents of the Columbia, the Potomac, the Missouri, the Mississippi, the Colorado, the Delaware, the Hudson and scores of other rivers throughout the land.

Nor is pollution confined to streams alone. Pollution problems, unless already-initiated control measures are continuously intensified, will mount with increasing water use in the Great Lakes and other inland fresh-water basins. The oceans themselves have not been able to assimilate the wastes of civilization that collect in bays and inlets along the more densely populated coasts. The closing of bathing beaches as health hazards is evidence of such pollution in many of the coastal states.

A. DEVANEY, INC.

One of the principal causes of water pollution is the dumping of liquid waste products from industrial processes into rivers and streams.

As long as raw or inadequately treated sewage and industrial wastes are discharged in any amount into streams or lakes anywhere, full use is not being made of the knowledge and skills that are available. Sanitary engineers many years ago worked out the necessary treatment for municipal and the more common types of industrial wastes. These processes remove 85 to 90 per cent of the readily removable contaminants from used liquids. In many cases, with assistance from the natural purifying processes that take place in the streams themselves, pollution can be satisfactorily controlled for some time to come. However, with increasing concentrations of people and factories, plus the changing nature of wastes, the development of new waste-removal processes takes on added importance. Ways must be found to remove much more of the contaminants than is possible by present methods.

During the past decade, better laws have been made to improve pollution control; more adequate appropriations have also been made. Still we have merely scratched the surface. We hope that by 1980 pollution abatement will have bridged the demand-supply gap by making greater water re-use possible. But until that time we must depend upon and hasten the application of the already known waste-treatment methods if we are to keep our surface waters clean. This is our only guarantee of enough water of the right quality to meet the nation's requirements.

GEOLOGY

TSUNAMIS:
Terror in the Pacific

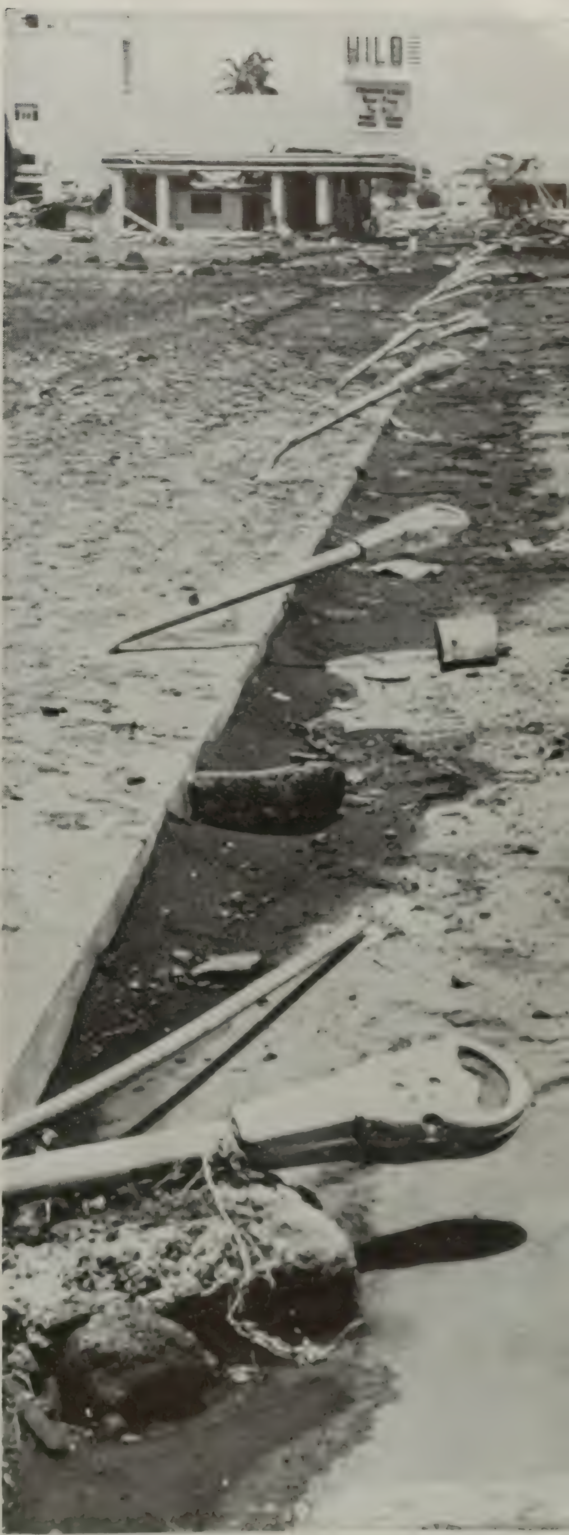
By ALEXANDER JOHNSTON

Free-Lance Writer

AT dawn on May 21, 1960, people along the rocky coast of Chile were roughly shaken awake by the tremors of an earthquake. For almost a minute the earth rocked and shuddered. Bridges snapped and collapsed. Houses crumpled. In many towns, fires broke out and there was no way to extinguish them, since water mains had been yanked apart by the jolt of the quakes. By the end of the day some 150 Chileans were dead and thousands more were injured or homeless. But this earthquake, disastrous though it had been, was only the preliminary to a week of calamities that spread panic and death over 6,000 miles of land and ocean.

More earthquakes followed on ensuing days. Four volcanoes that had been quiet suddenly sprang to life. They showered wide areas with smoke, hot ashes and molten lava, adding to the misery of the Chileans and killing people by the score. But worse was yet to come. Tidal waves hurled towering waves of water on the beaches, crushing everything in their paths. By May 26 the Chilean Government estimated the total loss of life at more than five thousand.

Chile was not the only country to suffer. Tidal waves swept across the wide expanse of the Pacific Ocean and crashed down on the coast of Hawaii. The waterfront of Hilo, Hawaii's second-largest city, was smashed, and more than 100 people were killed or missing. Sweeping past Hawaii, the succession of waves thundered down on Japan, devastating coastal towns. Some 35,000 Japanese



Battered almost to the ground, a row of parking meters in Hilo, Hawaii, gives dramatic testimony to the force of the tidal wave that struck on May 23.

UPI

houses were flooded; almost 2,000 were severely battered. In one place a twenty-ton fishing boat was lifted by the water and tossed more than half a mile inland.

Tidal waves like those that struck the coasts of Chile, Hawaii and Japan have always been among the most terrible disasters that nature has inflicted on man. The ancient Greeks, more than 2,000 years ago, recorded the fact that enormous waves flooded large areas of coastland. One of the most damaging tidal waves followed the earthquake that devastated Lisbon, Portugal, in 1755. For more than a week, water continued to beat upon the English coast, far from the center of the quake itself. Another notable tidal wave followed the explosion of a volcano on the South Pacific island of Krakatoa in 1883. It produced waves more than one hundred feet tall on the coasts of Java and Sumatra; even in faraway San Francisco, fishing boats were torn from their moorings. Thirteen years later another series of waves pounded Japan, destroying 10,000 homes and killing more than 25,000 people.

The Atlantic Ocean has suffered only one series of tidal waves in the last few centuries: the waves that followed the Lisbon earthquake. But in the Pacific they are fairly common occurrences. Somewhere in the Pacific there is a tidal wave about once a year, on the average. However, only once in every fifteen or twenty years does the water rise high enough to cause serious property damage and the loss of many lives.

There is a good scientific reason why few tidal waves occur in the Atlantic and many in the Pacific. The bottom of the Atlantic Ocean is relatively stable, with few major earthquakes and little volcanic activity. In the neighborhood of the Pacific Basin, however, the earth intermittently heaves and cracks. Volcanoes frequently erupt along the shores and even under the surface of the water. Immense blocks of sea floor abruptly slip, either rising or falling, along cracks that geologists call faults. Earthquakes often shake the bottom of the ocean and any major underwater disturbance can give birth to a tidal wave.

Scientists who study tidal waves like to call them by a different name, "tsunamis," for the waves have actually no connection with ordinary tides. *Tsunami* is a Japanese word that means "large waves in harbors," and it aptly describes the nature of the terrible waves. When a wave starts—perhaps from the impact of an earthquake—it is scarcely detectable. Indeed, sailors at sea have sailed right through some of the worst tsunamis without even noticing them. Most ocean waves are rather choppy and move rather slowly, but the tsunami is on such a large scale that it is difficult to visualize. In the open sea the waves may stretch a few hundred miles from crest to crest, and they may be no more than a few feet high. But the volume of water is enormous and moves at terrifying speed—up to 500 miles an hour.

As such a wave rushes toward a shore, it changes drastically. The water piles up against the sloping sea bottom and the wave rears up in all its fury. All the water that in the open sea extended over

WIDE WORLD

High but not dry, boats are stranded on the main street of Japan's Honshu Island, following tidal waves of May 24. The waves, caused by Chilean earthquakes, devastated long sections of Japanese coastline.

perhaps 200, 300 or 600 miles is compressed into one towering wave that crashes down upon the shore.

A full-blown tsunami is not just one wave but a long series of them. The first is likely to be quite small, not much bigger than the waves of ordinary surf. Then, as the trough behind the first wave reaches the coast, the water seems to be sucked away from the shore, as if the tide had suddenly dropped many feet. Often several hundred yards of sand are exposed and thousands of fish are left stranded and gasping. But then comes the second wave, far larger than the first. With the speed of an express train, it hurtles onto the shore and sweeps far above the mark ordinarily reached by high tides. From then on, the water alternately recedes far out to sea and then rises and pounds the shore. Some of the waves are conspicuously larger and more violent than others. Some scientists who have observed tsunamis think that the third to eighth waves are generally the biggest, although they cannot explain why this should be so. Altogether a tsunami may involve a dozen large waves spaced at intervals ranging from fifteen minutes to more than an hour.

Some parts of the Pacific region are much harder and more frequently hit than others. Japan, for example, has suffered fifteen major tsunamis since the year 1600. And, although the written history of Hawaii does not go back that far, it may be that Hawaii has had as many serious tsunamis as Japan.

Some parts of the coast suffer more damage than others, also. Where the land rises steeply from the bottom of the ocean to the beach, the waves do not get much opportunity to build up to terrifying heights. But where the slope is gradual, tsunamis generally do the greatest damage.

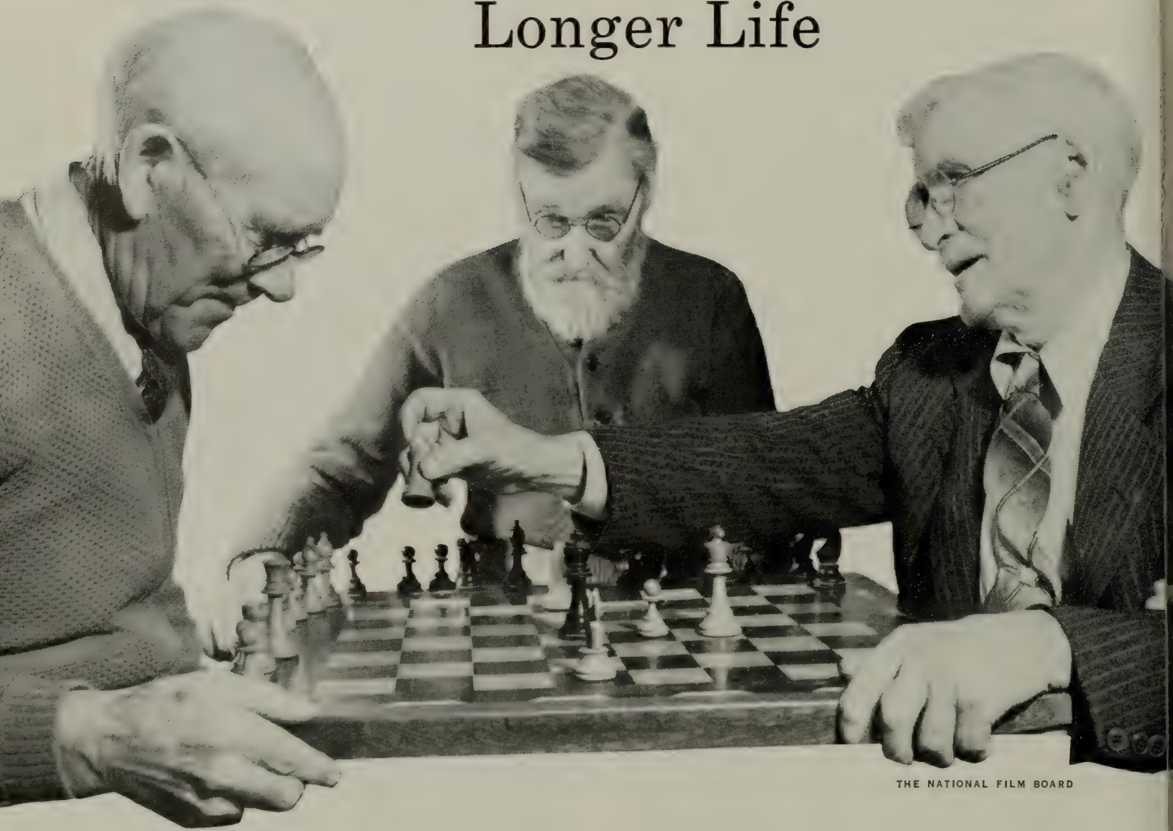
Sometimes a single tsunami strikes more than once. Dr. Francis P. Shepard, a distinguished scientist of the Scripps Institution of Oceanography, La Jolla, California, happened to be vacationing in Hawaii in 1946 when a disastrous tsunami struck the islands. The waves came and went. Then, eighteen hours later, they came again from a different direction. Dr. Shepard thinks that the waves, after first passing the islands, bounced back off undersea cliffs in the western Pacific, like billiard balls caroming off a cushion.

There is nothing that can be done to prevent tsunamis or even to lessen their frightening power. The forces that set them off and the enormous mass of water they contain are far beyond man's power to control. Nonetheless, lives can be saved if people who dwell in the tsunami regions of the Pacific take precautions. They are advised to build their houses on steep parts of the shore, where the abrupt rise of ground lessens the force of the waves. And they are warned to flee to high ground whenever the water is ominously sucked far out to sea following the first gentle wave of a tsunami.

Since Hawaii's 1946 disaster, a successful tsunami warning system has been operated by the United States Coast and Geodetic Survey. A simple instrument records the rise and fall of water near the shore. When extremely long waves begin to roll over the ocean surface, the instrument automatically sounds an alarm that is relayed to warning centers throughout the islands.

To supplement this on-the-spot alerting system, the Coast and Geodetic Survey transmits prompt reports from four earthquake-detecting stations in the Pacific. Thus Hawaii can usually be alerted whenever there is a major geologic disturbance that might start a tsunami. Last summer the United States, the Soviet Union and Japan agreed to co-operate in extending this warning system to all parts of the Pacific. If this system works as well as is anticipated, thousands of lives might be saved in the course of a few decades. Of course, nothing could have saved the Chileans from the immediate effects of the earthquakes that rocked their country last May. But with enough warning to the people in Japan and Hawaii, it would have been possible to reduce the scale of the disaster that swept across almost half the world.

Studies toward a Longer Life



THE NATIONAL FILM BOARD

By HENRY S. SIMMS

College of Physicians and Surgeons
Columbia University

A LONG life has been man's hope for many centuries. Now that progress is being made in the study of longevity (length of life), of aging and of disease, there are questions that need to be answered. Why does the death rate increase progressively as we grow older? In other words, why do more people of sixty years die each year than people of thirty? Is this a manifestation of aging? What is the relationship between longevity and aging? How does disease affect longevity? What is the difference between disease and aging?

Before I try to answer these questions, let me tell you about some research with rats that Dr. Benjamin N. Berg and I have been doing for a number of years. Our rats are not ordinary ones; they are tame white rats quite unlike the wild ones that infest garbage dumps and spread disease to man. On the contrary, we carefully protect our rats from infectious diseases that can be spread to them from others. Unlike most experimental rats, they are practically free from infectious diseases.

These pampered animals are specially bred and are maintained under very favorable and uniform conditions. Their quarters are quarantined to protect them from outside contact. They have the same controlled length of day and night throughout the year, the same temperature, the same humidity and the same food. They have never seen an electric light bulb because they receive only indirect light reflected from the walls—the same amount of light for all the animals. The conditions have been so carefully planned that their quarters have become known as the "Rat Palace."

Over a period of years a large number of these rats were allowed to live their full life span up to the time when they became moribund (about to die). As each animal reached a moribund state, it was killed by the injection of Nembutal and was subjected to a complete autopsy. Tissues from each organ were preserved and then thin slices from these were examined under the microscope. In this way the diseases that had developed in each rat up to the time of its death were observed and carefully recorded, along with data on age, sex, body weight, weight of organs and so on. Many diseases and various types of tumors were found. However, we have been interested particularly in five major diseases that were most common in the male rats. These involved the heart, the kidneys, the arteries, the voluntary muscles and the pituitary gland.

As would be expected, the older animals were found to have more diseases, and more advanced ones, than the younger rats. For example, the kidney disease was sometimes found in very young animals, and with advancing age the incidence (frequency of occurrence) increased gradually until half the rats had this disease at 570 days of age while nearly all had it at 1,100 days of age. On the other hand, muscle disease was not observed until 500 days of age, but the incidence then increased so rapidly that all rats reaching 1,100 days of age were found to have this condition.

Having obtained the data on incidence of diseases, we then computed the probability that a rat of a given age would acquire each of the five selected diseases within the next 100 days. This "probability-of-onset" of each disease was found to increase progressively with the age of the animal, in accordance with a very simple equation. The rate of this increase is different for each disease.

We had previously shown that mortality (probability of death) in the rat followed an equation that was identical in form with this one. The evidence indicated that the increasing death rate with advancing age was the direct consequence of the increasing probability-of-onset of the major diseases. It follows that if we wish to study longevity, we must study the onset of disease.

What is true for the rat is also true for man. In 1825 an actuary (insurance expert) named Benjamin Gompertz was the first to note that adult human mortality increased with age in accordance with an equation equivalent to the one mentioned before. This observation is known as Gompertz' law. More recently, Dr. Dean F. Davies studied a large number of human autopsy records and found that the data on selected adult diseases were consistent with our equation for rat data—except that the onset of these human diseases occurred many years later than the onset of rat diseases.

Therefore, our human life span is dependent upon the rate at which the probability-of-onset of diseases increases with age. The later the onset of disease the greater is the life expectancy.

Why does the onset of disease increase progressively with age in accordance with the equation? This is because there

As man's life span increases, the universal hope for serene and useful old age becomes more of a reality.

HENLE — MONKMEYER

is an age of most probable onset for each disease, while the individuals vary in regard to the age at which they will acquire that disease. Some will acquire it earlier and some later—and some may not get it at all. When a number of animals grow older, those that are more susceptible to disease die off, and those that survive longer are more nearly alike in the age at which the disease becomes manifest. As a result, the probability-of-onset of disease changes with age in accordance with our equation. This serves to explain Gompertz' law, which was published 136 years ago. However, if you ask why an individual is predestined to acquire nephritis (inflammation of the kidneys) at age X, or heart disease at age Y, we can only say that this is inborn in the individual. In part, it is a characteristic of his species; in part it is inherited from his own ancestors.

So much for the relation of disease to longevity. Where does aging come into the picture? For that matter, what is aging? According to my conception, aging consists of those changes that take place with passing time in tissues and cells, in physiological functions, in physical and mental abilities, and in resistance to the onset of disease.

A rat that dies at 950 days does not die from aging. It dies from disease—but aging of the rat determines when it will be afflicted with the disease. Aging and disease are not the same—aging predisposes to disease.

Some years ago I published a rather startling statement which has been quoted many times. I said, "It is computed from data of 1943 that *if* the mortality rate could be maintained constant at the level of the age of ten, we would have a life expectancy of 800 years and some individuals would survive to 22,000 years." This statement was correct, and still is, but the *if* is insurmountable. There is no likelihood that man can ever keep his death rate down to what it is at the age of ten—this is obvious.

Nevertheless, it is to be expected that the human life span (as well as mental alertness) can be extended considerably beyond the present limits. Medical research on the treatment of disease has added many years to the average life span—but not yet to the maximum age of the very old.

Is it possible to extend the life span by some method that will delay the onset of disease? The answer is yes. Some years ago Dr. Clive M. McCay reduced the food intake of rats and thereby caused them to live longer. Recent experiments by Dr. Berg in our "Rat Palace" have confirmed the beneficial effects of restricted diet. Furthermore, they have shown that this is brought about by a considerable delay in the onset of the major diseases of this species—not just one or two diseases. Rats, like some human beings, tend to be gluttons. They eat more than is good for them. Moderation in eating can postpone the onset of their diseases and hence can postpone their death.

Are there other ways to delay onset of diseases, thereby extending life span? I imagine that there are, but at present we do not know. More research is needed, but research on the onset of disease, which is essential for thorough investigation of longevity, is very expensive and very slow. We feel, however, that it is a necessary adjunct to research on prevention and treatment of specific diseases. We believe that the possible extension of the life span of millions of people is fully as important as landing a man on the moon.

From time to time there are newspaper reports of a "cure for aging," or an "antiaging" agent. These reports are regrettable. It is safest to take all of them with a large grain of salt until research on aging has made more progress. In my opinion, no agent or treatment can be said to affect aging unless it has been shown to delay the onset of all major diseases.

Medical research is still young. Research on longevity and gerontology is in its infancy. You can look for important progress in this field, but the work takes time. However, with time, money and diligent research, man's years of healthy life may be considerably extended.

What Do You Weigh?

By CECIL J. NORTH, *President*

METROPOLITAN LIFE INSURANCE COMPANY

SINCE the turn of the century, life-insurance companies have been making studies of the relationship between weight and longevity (length of life). Conclusive evidence now proves that overweight shortens the lives of millions of people.

The most extensive of these studies was recently completed by the Society of Actuaries. It shows that men of the present generation tend to be heavier than their fathers. Women, on the other hand, have become thinner. The average weight of women in their twenties, for example, is about five pounds less than it was three or four decades ago. In contrast, the average weight of men in their twenties and thirties has increased about five pounds.

Average weights for both men and women increase with advance in age through the fifties. The pattern is different, however, for the two sexes. Men start putting on extra pounds rapidly during their twenties and early thirties, but the gain in weight then slackens off. Among women, the increases in weight are most rapid between the ages of 35 and 45.

It has long been known that after age 30 the lowest mortality (death rate) is found among persons below average weight. What, then, is the most desirable weight from the viewpoint of longevity? While the recent actuarial study showed that the lowest mortality past age 30 is found among persons 15 to 25 pounds below average weight, the most desirable weight for a particular individual depends on a number of factors. The most important of these are sex, height and body frame. The Metropolitan Life Insurance Company first constructed tables of desirable weight twenty years ago. From the information recently published by the Society of Actuaries it has prepared new tables of desirable weights. These tables show somewhat lower weights than the earlier ones because persons experiencing lowest mortality now are underweight to a greater degree than those of a generation ago.

The new tables show ranges of desirable weights for men and women at ages 25 and over, according to height and body frame (reflecting chiefly body width). For example, men who are 5 feet, 5 inches tall, with small frames, should preferably weight from 121 to 129 pounds. For women, the comparable weight range is from 111 to 119 pounds. It may be noted that, ideally, weight should not increase after age 25.

NEW WEIGHT TABLES

Weight in Pounds According to Frame (In Indoor Clothing)

Desirable Weights for Men of Ages 25 and Over

HEIGHT (with shoes on) 1-inch heels		SMALL FRAME	MEDIUM FRAME	LARGE FRAME
Feet	Inches			
5	2	112–120	118–129	126–141
5	3	115–123	121–133	129–144
5	4	118–126	124–136	132–148
5	5	121–129	127–139	135–152
5	6	124–133	130–143	138–156
5	7	128–137	134–147	142–161
5	8	132–141	138–152	147–166
5	9	136–145	142–156	151–170
5	10	140–150	146–160	155–174
5	11	144–154	150–165	159–179
6	0	148–158	154–170	164–184
6	1	152–162	158–175	168–189
6	2	156–167	162–180	173–194
6	3	160–171	167–185	178–199
6	4	164–175	172–190	182–204

SOURCE: Supplement to Metropolitan Life Booklet, *How to Control Your Weight*

Desirable Weights for Women of Ages 25 and Over

HEIGHT (with shoes on) 2-inch heels		SMALL FRAME	MEDIUM FRAME	LARGE FRAME
Feet	Inches			
4	10	92– 98	96–107	104–119
4	11	94–101	98–110	106–122
5	0	96–104	101–113	109–125
5	1	99–107	104–116	112–128
5	2	102–110	107–119	115–131
5	3	105–113	110–122	118–134
5	4	108–116	113–126	121–138
5	5	111–119	116–130	125–142
5	6	114–123	120–135	129–146
5	7	118–127	124–139	133–150
5	8	122–131	128–143	137–154
5	9	126–135	132–147	141–158
5	10	130–140	136–151	145–163
5	11	134–144	140–155	149–168
6	0	138–148	144–159	153–173

For girls between 18 and 25, subtract 1 pound for each year under 25.

Unfortunately, about half the men in their thirties weigh at least 10 per cent more than their desirable weight; about one fourth of these men exceed it by at least 20 per cent. To translate these percentages into numbers—6,000,000 American men in their thirties are 10 per cent or more above their desirable weight, and about 3,000,000 are 20 per cent or more above it. The proportion of men who weigh appreciably more than their desirable weight increases with advance in age. The proportion of women at least 20 per cent above desirable weight is about the same as for men under age 40, but exceeds that for men beyond this age.

The adverse effect of overweight is neatly expressed in the maxim, "The longer the waistline, the shorter the lifeline." Thus, the mortality of men 10 per cent or more overweight is one third higher than that for men of desirable weight. For men 20 per cent or more overweight, the excess mortality is nearly half.

Figures on expectation of life illustrate the adverse effects of overweight even more dramatically. For example, men 45 years of age who are of medium height and frame and weigh 170 pounds—close to the average—have an expectation of life one and one half years less than that for men of comparable build who weigh 150 pounds, which is within the range of desirable weights. Those weighing 200 pounds, or 50 pounds above desirable weight, can expect to live 4 years less than the men weighing 150 pounds.

Overweight people are subject to an excess mortality from all the leading causes of death. Heart disease, which is the dominant factor in total mortality, shows a considerably higher than average death rate among overweight people. For example, among men about 20 per cent overweight or more the death rate from heart disease is more than two fifths higher than average. The excess is even higher for cerebral hemorrhage and kidney disease and is particularly high for diabetes. Excess weight apparently puts an extra strain on the heart and other internal organs. Overweight people also have a somewhat higher death rate than average from pneumonia and influenza, and from cancer.

The main cause of overweight is too much food and too little exercise. While this may be an oversimplification of the problem, it is usually the basic cause of "middle-age spread." Diminishing exercise that accompanies aging helps the pounds pile up. A person's activity slows down while his eating habits fail to change. Glandular disturbances do occasionally contribute to overweight, according to medical authorities, but even in these instances doctors believe that proper diet will melt pounds away. Heredity also plays a part though just how much is not clear. Thus persons may inherit heavy muscles and large bones. This factor of body build is most clearly illustrated in the difference between the weights of males and females. Men tend to have heavier bones and larger muscles, which account for the greater weight of men compared to women of the same height.

A pioneer study made in the Metropolitan Life Insurance Company some years ago, recently repeated by the Society of Actuaries, indicates that among overweight people who reduce there is lower mortality, at least for a period of years.

To get down to a desirable weight, it is necessary to follow a plan. The Metropolitan's Health and Welfare Division recommends:

1. Learn the best weight for you.
2. See your doctor and with his help try to discover why you eat what you do.
3. Educate your appetite: learn what foods are low in calories, high in nutritive value.
4. Eat a variety of foods, but in smaller portions.
5. Determine how many pounds it is reasonable for you to lose and do it on a slow but persistent basis.
6. Plan to be more active. Moderate exercise will help to burn up superfluous fat. To be successful and safe, a program of exercise should be approved by your doctor.
7. Steer clear of reducing drugs.

METEOROLOGY
Enters the Space Age

By DAVID S. JOHNSON, *Chief*
Meteorological Satellite Laboratory
United States Weather Bureau

The Tiros I meteorological satellite being launched from Cape Canaveral by a Thor-Able rocket system.

THE science of meteorology dramatically entered the space age on April 1, 1960, with the launching of the 270-pound Tiros I weather satellite by the National Aeronautics and Space Administration. (The name "Tiros" comes from *T*elevision and *I*nfra*r*ed *O*bservation *S*atellite.) During its lifetime of nearly three months. Tiros took and radioed back to earth more than 20,000 pictures. They show land and sea areas, clouds, snow-capped mountains and floating ice, over almost three fourths of the earth's surface. Other weather satellites, planned to overcome such limitations as Tiros I has shown. will add greatly to the knowledge provided by this pioneer in the field. In fact, weather satellites offer promise, within the next few years, of providing a greater increase in observations of the earth's atmosphere than we have attained during the entire previous history of meteorology.

The atmosphere is a continuous ocean of air surrounding our planet. Its greatly varying states influence to a large degree many of man's activities. The purpose of weather research and weather forecasts is to help human beings to adjust to this ever-changing atmospheric environment.

Prior to the advent of weather satellites, atmospheric measurements at the earth's surface were made at weather stations located in populated areas and by many ships at sea. The atmosphere high above the surface has for many years been probed by weather instruments carried aloft by balloons and aircraft; and the highest reaches of the atmosphere have occasionally been penetrated by rockets. There has been in recent years a steady increase in the number of such routine weather observations. However, only a very small part of the atmosphere can be regularly measured by these conventional meteorological observing techniques. Large storms can still remain undetected for days in many desert, polar and ocean areas where weather stations are few or nonexistent. Even in areas such as the

United States, where there is a relatively dense network of weather-observing stations, small storms, often of great violence, may develop without being detected at any of these stations.

The artificial earth satellite provides an "observer" that will in time be capable of obtaining weather measurements at frequent intervals from every point on the earth's surface and in the atmosphere. When the weather-satellite system now planned is in full operation, meteorologists will no longer be forced to leave on their global weather maps the large gaps now made unavoidable by lack of observations over much of the earth's ocean, desert, jungle and polar areas.

The experimental Tiros I satellite represents an important step toward the development of such an operational system. Its downward look at the clouds indicates how a system of satellites could provide photographs that can be used in identifying and tracking most terrestrial storms and in detecting the birth of new storms and the death of old ones. The clouds pictured by Tiros I show the physical processes going on in the atmosphere. By studying these pictures, meteorologists have been able to deduce much about the state of the atmosphere at the time when the cloud pictures were made.

Probably the most spectacular cloud systems photographed by Tiros I were those associated with large cyclonic vortexes, or storms. These vortexes contained spiral bands sometimes reaching more than a thousand miles in diameter. The amount of organization in these cloud systems had not been realized before. A striking similarity in gross pattern is seen between some vortexes and the spiral nebulae photographed by astronomers.

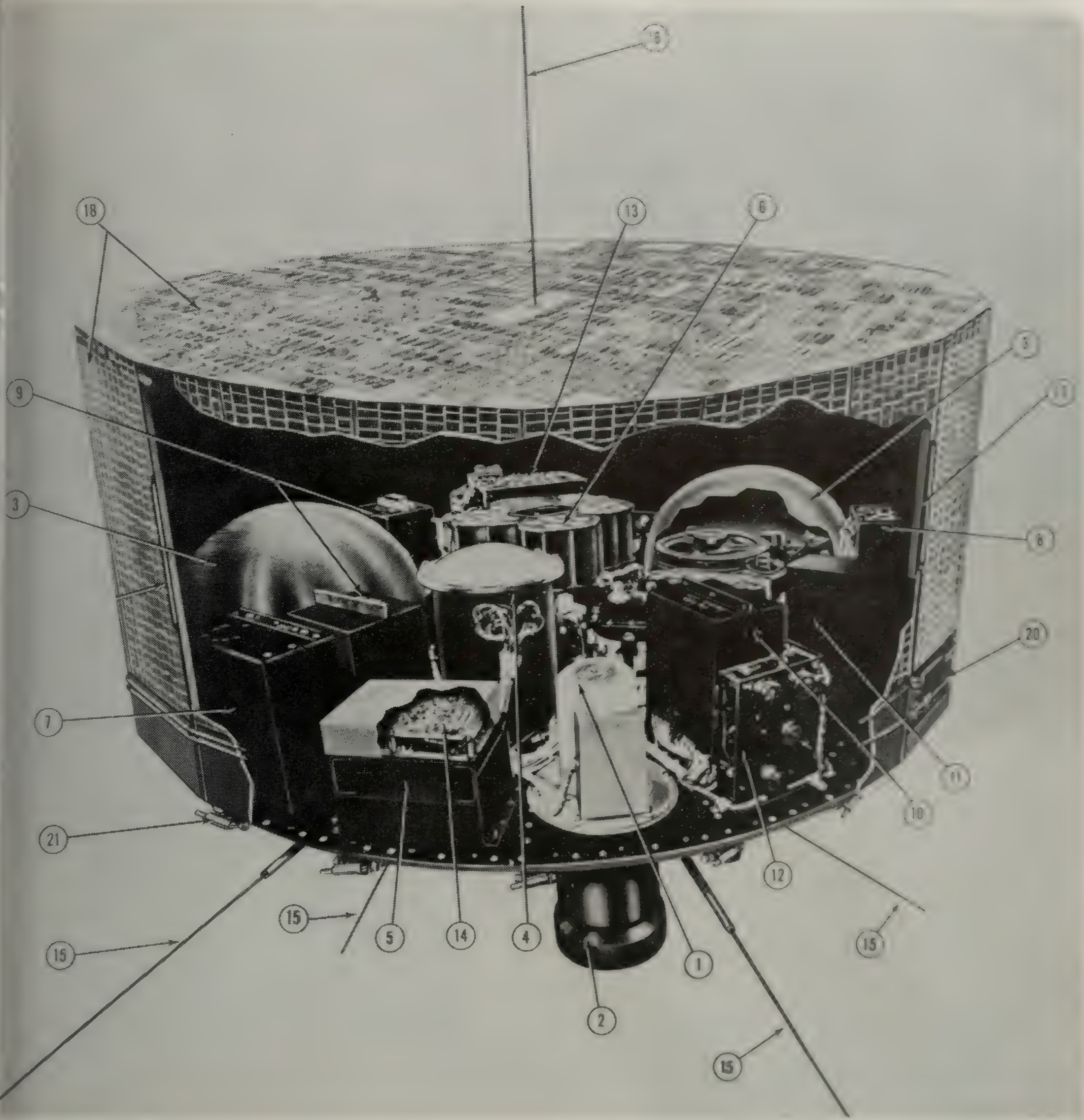
An isolated bright image in one Tiros picture was produced by a cloud mass located in the Midwestern United States. Standard meteorological observations made at the same time as the photograph indicated that this mass was composed of cumulo-nimbus clouds (towering, mountainous clouds) that were producing a number of thunderstorms. Two hours later, this same cloud mass spawned several tornadoes and hail storms. Similar bright images have been discovered in other Tiros I pictures. It seems probable that such photographs may in the future be used to locate areas where severe local storms are likely to occur.

Hurricanes, which so often produce great loss of life and property, frequently form over the areas of the oceans where their early detection has not been possible because of the scarcity of weather observations. One of Tiros' most interesting photographs was of a hurricane north of New Zealand, where such storms are called typhoons. Many lives may be saved in the future by the early detection and tracking of such severe storms by weather satellites.

We can also learn much from weather satellites about wind direction aloft. Tiros I produced photographs of long, narrow lines of clouds, called "cloud streets." In some areas these cloud streets indicated the direction in which the upper winds were blowing. Other clouds photographed by the satellite indicated the presence of the jet stream, a stream of air moving at a considerably higher speed than the air surrounding it.

Many of the phenomena seen in the Tiros pictures raise new questions about the atmosphere. However, the cloud information has already been used in some cases to supplement conventional observations, particularly in determining the position of storm centers and fronts over ocean areas. Further progress will be made as a result of more detailed studies of the photographs.

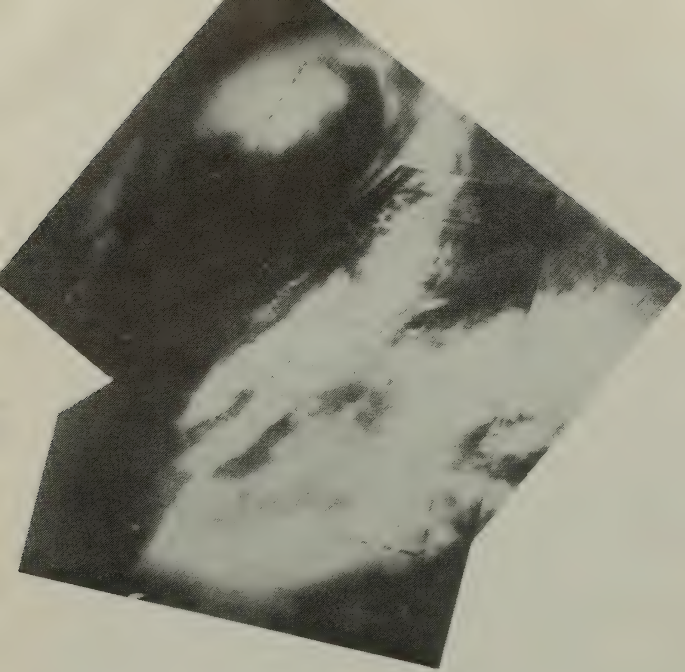
It is not possible to obtain complete daily global coverage with the Tiros I and the subsequent Tiros satellites. In the first place, the Tiros satellites do not travel poleward farther than 48° in either north or south latitude. (Forty-eight degrees is the angle of inclination of the orbit with respect to the earth's equator.) Furthermore, because of the spin—for stabilization—of the hatbox-shaped Tiros, and the location of the television cameras, pictures can be taken of the earth only at definite places in the orbit. Coverage is also limited to those areas of the globe that



Tiros' instruments: 1—one of two half-inch Vidicon TV cameras; 2—wide-angle lens; 3—tape recorders; 4—electronic timer for operational sequencing; 5—TV transmitter; 6—chemical batteries; 7—camera electronics; 8—tape-recorder electronics; 9—control circuits; 10—auxiliary controls; 11—power converter, tape motor; 12—voltage regulator; 13—battery-charging regulator; 14—auxiliary synchronizing generator, TV; 15—transmitting antennas; 16—receiving antenna; 17—solar sensor to measure satellite's position with respect to sun; 18—solar cells; 20—despin mechanism; 21—spin-up rockets.

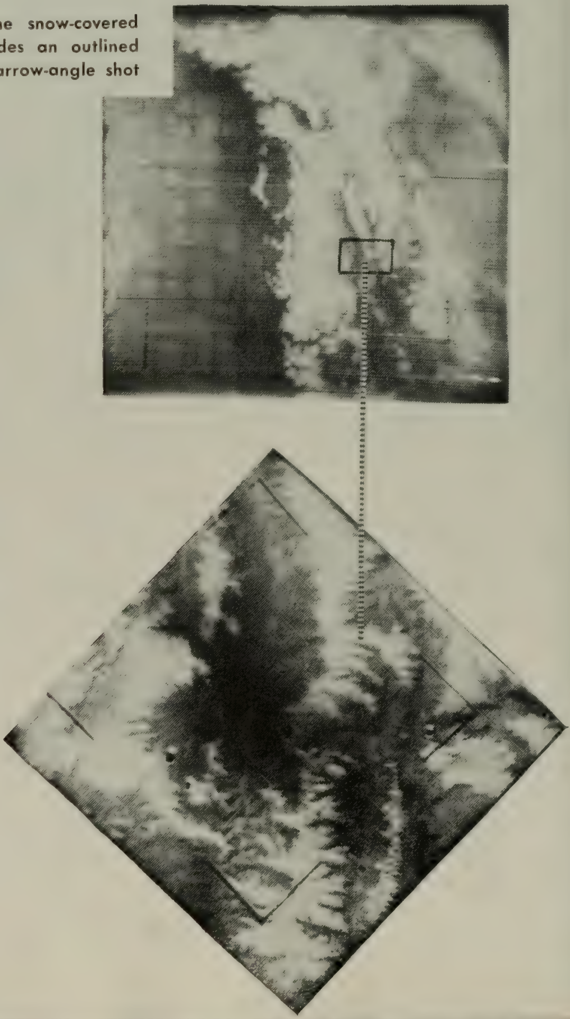
are brightly illuminated by the sun's light.

The Nimbus satellite, now under development by the National Aeronautics and Space Administration, is designed to overcome the inherent coverage limitations of the Tiros. Its cameras and other instruments will be pointed directly toward the earth's surface beneath the satellite. The Nimbus will also be in a near-polar orbit. Because the orbital plane of the satellite will be inclined an appropriate amount with respect to the earth's axis of rotation, the Nimbus will cross the equator at the same local time on each orbit. If launched

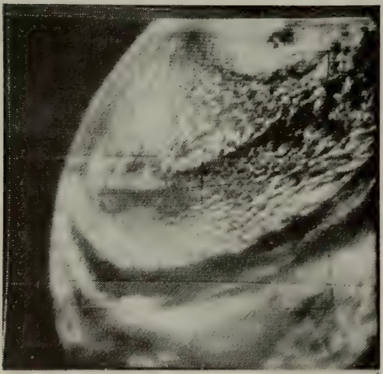


A well-developed storm center over Nebraska, as photographed by Tiros at 3:30 P.M., EST, on April 1, 1960. The circular cloud mass at the top is the storm's center; a cold front trails south and southwest from it to the large cold mass (foreground) near the Gulf Coast of Louisiana and Mississippi.

The wide-angle photograph of the snow-covered Himalayan Mountains (right) includes an outlined area shown in more detail in a narrow-angle shot below.



The large storm shown was located about eight hundred miles west of southern California on April 4, 1960.



ALL ILLUSTRATIONS, NASA

at the proper time, it will view the earth's surface in daylight and at night once every twenty-four hours. (Of course the winter polar area would be observed only in darkness.) Camera systems similar to those used on Tiros can obtain cloud pictures in daytime. Infrared scanners now under development offer the possibility of providing images of clouds at night, thus doubling the frequency of cloud observations each day.

Other types of meteorological observations by satellites have been made or are being planned. The Explorer VII satellite launched on October 13, 1959, carried out an experiment devised by Verner Suomi of the University of Wisconsin to measure the amount of solar radiation received by the earth and its atmosphere, as well as the amount of heat lost by our planet by infrared radiation to space. These measurements give the "heat balance" of the atmosphere, which is basically a giant heat engine. The heat balance is such that the equatorial regions of the earth's atmosphere become hotter than the polar regions. The atmosphere attempts to equalize these temperature differences by movement of air from one region to another. Thus, knowledge of changes in the heat balance may indicate changes in the large-scale motions in the earth's atmosphere.

Results already obtained from the Explorer VII heat-balance experiment show differences in radiation in an east-west direction as large as those observed between polar areas and the equator. These large differences are associated with the centers of storms and fair weather areas. Similar measurements will be taken by future Tiros and Nimbus satellites. The study of such data collected over more of the earth and for longer periods of time than was possible with Explorer VII will aid in determining the mechanisms of our atmospheric heat engine.

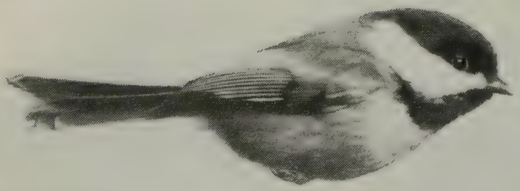
The earth's atmosphere absorbs and scatters radiation that is passing through it and emits radiant energy in a very complex way. This is determined principally by the amounts and types of gases, such as carbon dioxide, water vapor and ozone, existing in the atmosphere, and the temperature of these gases. Thus, certain radiation measurements can be made by satellites which will provide information on radiation and the composition and temperature of the atmosphere.

A method is under development, for instance, whereby satellite measurements can be used to determine the temperature structure of the atmosphere, at least at altitudes above 20,000 feet. In this method, infrared radiation received at the satellite from carbon dioxide in the atmosphere is used to determine the atmospheric temperatures. Other radiation-measurement techniques are being considered to determine the temperature at the earth's surface or at the tops of clouds, and to measure the amount of ozone and water vapor in the atmosphere.

The possibility of mapping the areas of the earth where rain or snow is falling, by using a satellite-borne radar, is also being studied. It may be possible one day to use a radar which will measure the height above the ground of the bases and tops of clouds beneath the satellite.

The number of measurements that will be obtained from meteorological satellites in the next few years will range into millions per day. The time is approaching when these observations will be available on a continuing basis. Data-processing systems must be made ready to handle this giant flow of data and to present the resulting analyses in a form that can be assimilated and used by the meteorologist. Systems utilizing high-speed digital computers, picture-storage, retrieval and display devices, high-speed automatic map-drawing devices and other modern techniques are already in varying stages of development.

The need will markedly increase for rapid communications to transmit the ever growing number of weather-satellite data from read-out stations to analysis centers and then to transmit the final analyses to forecast centers. Indeed, it is likely that communication satellites will be used to transmit meteorological data, perhaps even throughout the world, for the benefit of all mankind.

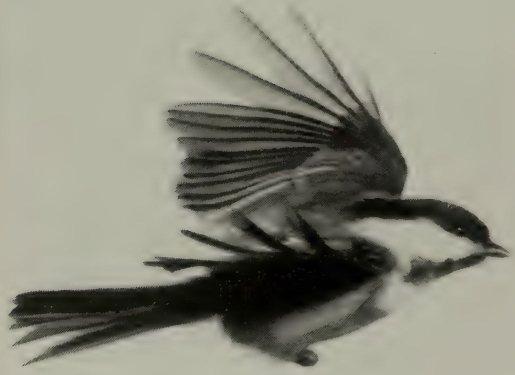


BIRD FLIGHT

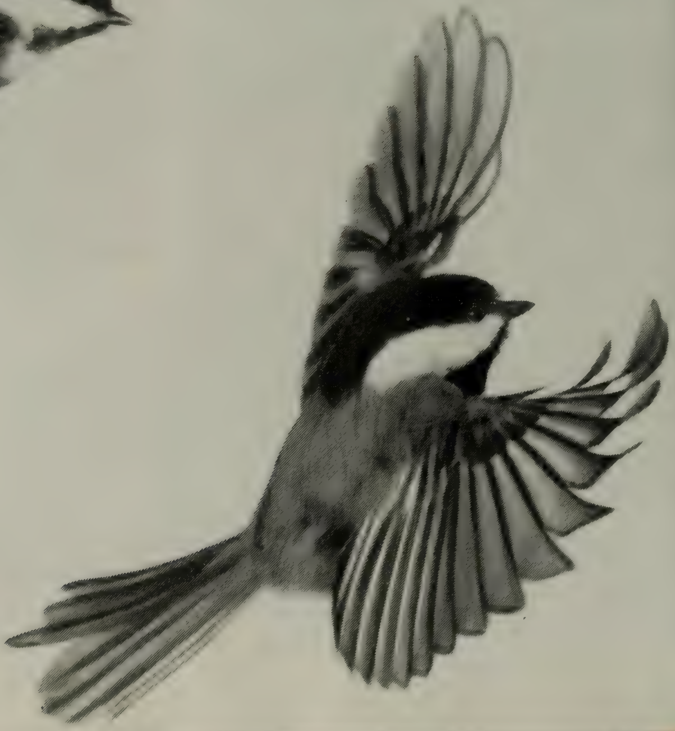
BIRDS in flight, soaring and gliding with the wind, have always symbolized for man the beauty of freedom. Only recently, however, with the coming of fast modern photography, have we begun to understand the mechanics of bird flight. The series of pictures presented here was taken by Henry C. Johnson, a free-lance photographer of Hart, Michigan. The individual photographs were clipped from a continuous film showing the approach of a chickadee to its perch, each picture having an exposure of 1/12,000th of a second.

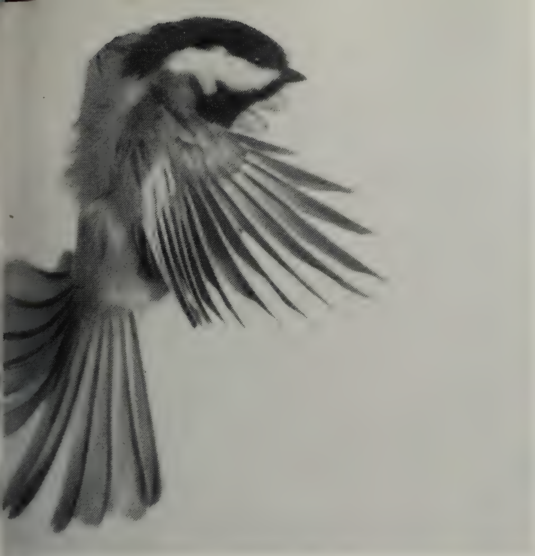
The chickadee in level flight about eight feet from the perch on which he will alight. In this glide, wings are folded and landing gear retracted.

In this photograph we see the downstroke of the chickadee's wings. The bird will regain altitude with three or four flaps of his wings.

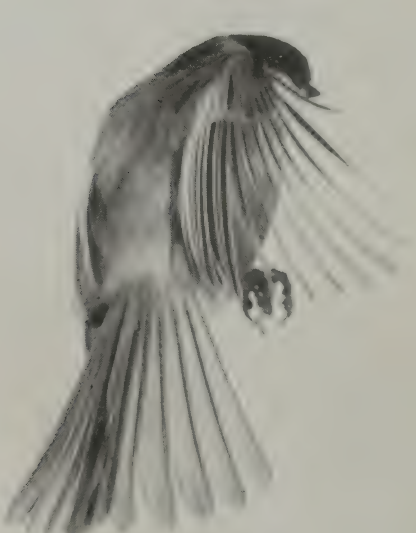


As he comes closer to the perch for which he is aiming, the chickadee is tilted almost to the vertical in a few thousandths of a second.

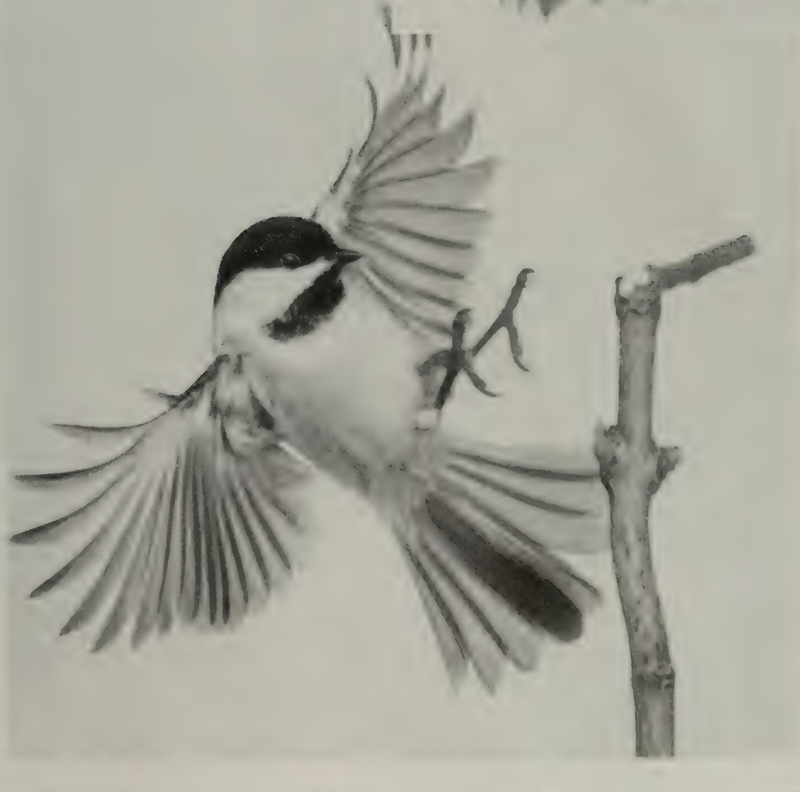




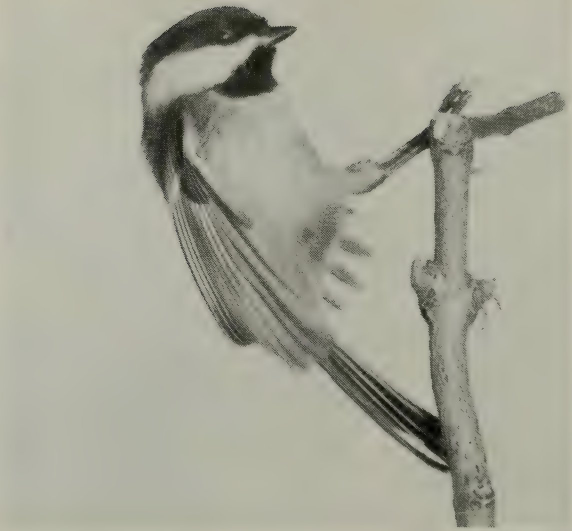
Here the bird is completely vertical and is still coming fast, with brakes full on and landing gear still retracted. Air pressure created by the forward motion forces back wing, tail, neck and back feathers.



Now that he is only a scant eight inches from the perch, the bird decides that the time is ripe and he begins to lower his landing gear. With only thousandths of a second to go, he needs to be ready.

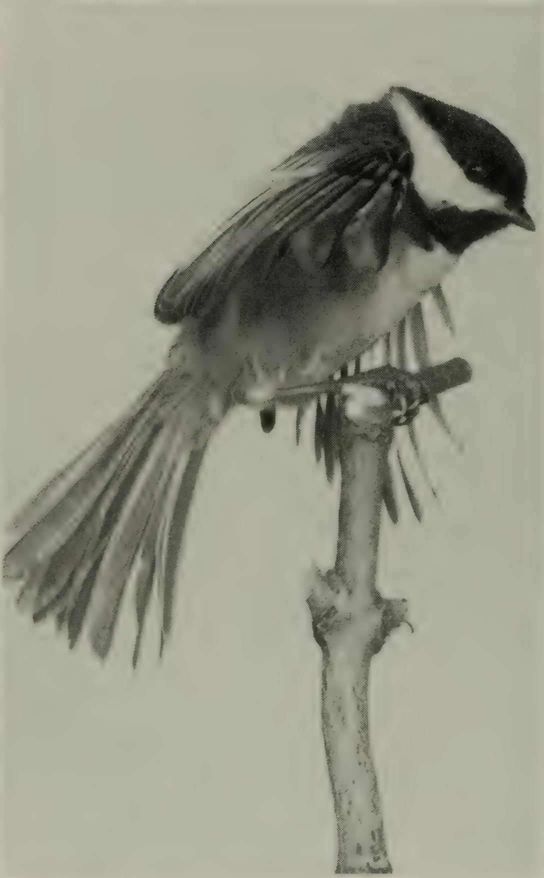


With scarcely three inches to go, the legs are not yet fully extended but the feet are carefully aimed and the toes, parallel.

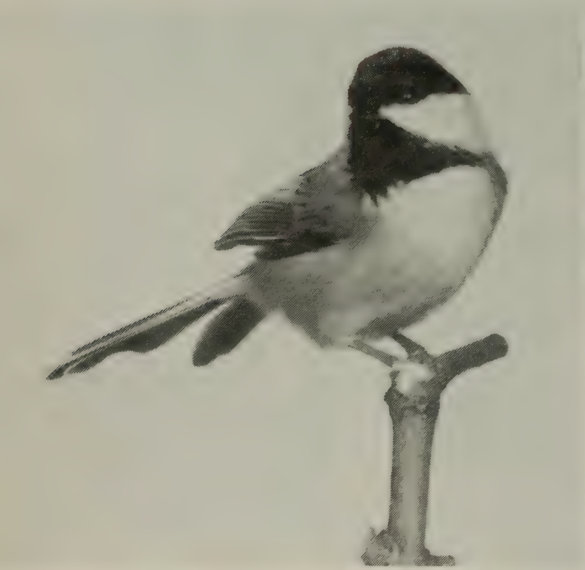


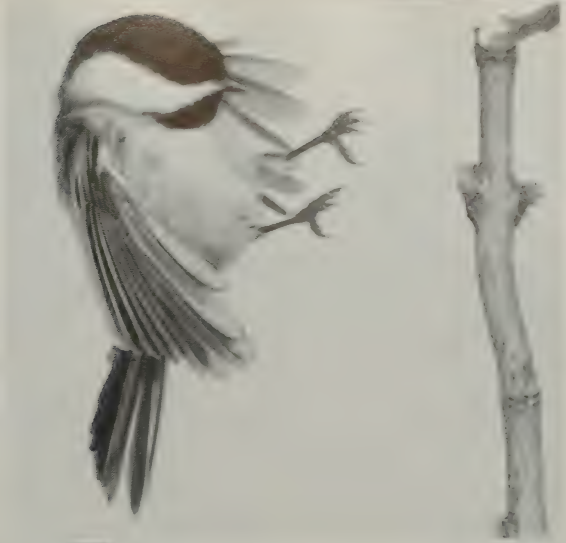
The feet have not made contact but the final touchdown is now a sure thing.

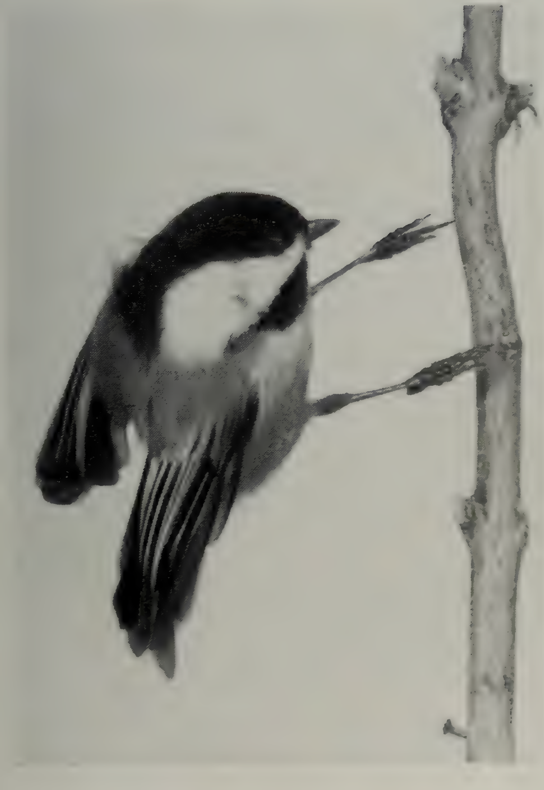
The wings are still working to maintain balance and to check forward motion.



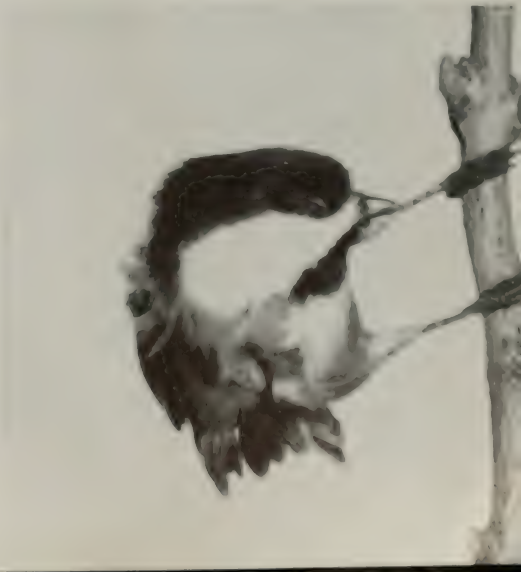
Arrived safe and sound, the chickadee now looks around him and takes a bow.







In this series of three photographs, we see the way in which the chickadee approaches a vertical rather than a horizontal perch. At the time of contact with the perch the toes are not spread but held closely together.



PHOTOS, HENRY C. JOHNSON

THE USES OF EXTREME COLD

By ROLAND W. SCHMITT

General Electric Research Laboratory

ROCKETS that are being fueled before firing at Cape Canaveral are often surrounded by what appear to be clouds of steam. Many people wonder about this and even ask what purpose a steam bath plays in a successful launching. The answer is that the clouds are not steam but cold vapor from boiling liquid oxygen, which boils at 297° below zero Fahrenheit. This extremely cold fuel is often used in rocket engines that propel man-made satellites into space. Oxygen and some other gases in liquid form are very much easier to handle and can be stored in smaller space than many other kinds of fuels. These gases can be liquefied by complicated processes of expansion and cooling.

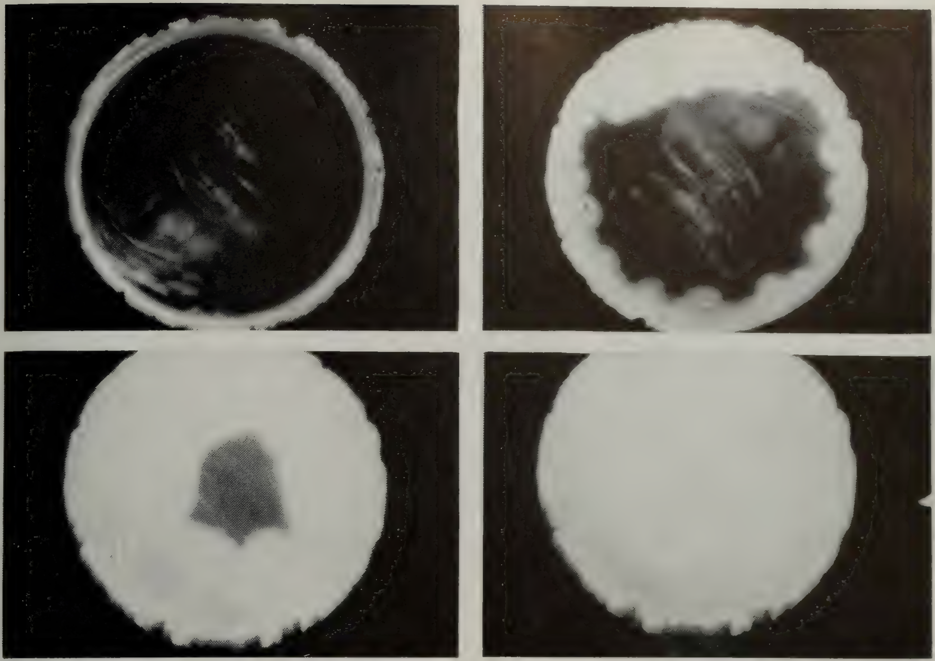
The study and use of very low temperatures is known as cryogenics (from the Greek words for "icy cold" and "to become"). Almost fantastic developments have already resulted from work in this field, of which the missile fuels are only one example. It would be a mistake to assume that scientists have only recently become interested in the behavior of matter under conditions of extreme cold. Their curiosity has caused them over the years to push continually to lower and lower temperatures.

About 1714, Gabriel Daniel Fahrenheit, a German physicist, established what is known as the Fahrenheit scale, the one most commonly used in everyday life in English-speaking countries. Zero on this scale was fixed at the lowest temperature that Fahrenheit could reach. More than one hundred years later, Michael Faraday, an English chemist and physicist, succeeded in reaching a temperature of −166° Fahrenheit (F.). After Faraday, other scientists continued the pursuit of lower temperatures, and steady progress has been made during the last century. In 1959, a temperature of only one ten-millionth of a degree above absolute zero was reached by scientists at Oxford University. (Absolute zero, which is theoretically the lowest possible temperature, is −459.69° F.) The Oxford record may seem, to the layman, so close to absolute zero that the difference is unimportant, but not so to the scientist. The limit of absolute zero, however, is forever unattainable according to a fundamental law of physics.

Instead of using the Fahrenheit temperature scale, scientists prefer to use one that starts at absolute zero. This is called the Kelvin scale and is named after William Thomson Kelvin, a British mathematician and physicist, who originally suggested it. On the Kelvin scale absolute zero becomes 0° K., and the scale goes up at a rate of a little more than one degree Kelvin for each two degrees Fahrenheit. One great advantage of the Kelvin scale is that it tells you directly how far above absolute zero a temperature is.

Before 1940, only a few laboratories in the world could produce temperatures below 20° K. Following World War II, Professor S. C. Collins of Massachusetts Institute of Technology developed a new type of helium liquefier, superior to earlier ones. The rapid evaporation of liquid helium produces very cold temperatures, and a laboratory with a supply of this liquid can achieve temperatures down to about 1° K. very easily.

As the Collins liquefier became more widely used, low-temperature research grew. Research at temperatures below 1° K. remained much less popular, but the time has now come when even this temperature region will probably be explored more widely. New commercial, magnetic refrigerators, starting at 1° K., can easily reach temperatures of a few tenths of a degree. Another way of attaining these ultralow temperatures—as low as 0.2° K. to 0.3° K.—is by the use of helium-3, an isotope of ordinary helium-4 and a by-product of the hydrogen bomb.



This series of pictures shows, by a special optical trick, how a metal (tantalum) disc goes from a superconducting state to a non-superconducting state as magnetic-field intensity is increased. The superconducting part of the disc is dark and the part where superconductivity has been destroyed is light.

These tools of research—liquefiers and refrigerators—have made possible technical applications of low-temperature science. Because of the great demand, several companies have built plants to liquefy hydrogen and helium, and these liquids can now be purchased commercially. Containers for storing and transporting them have been developed and they can be shipped long distances. Small, inexpensive refrigerators to cool small pieces of equipment down to 20° K. are on the market.

Scientists and engineers are convinced that many of the striking phenomena that occur at low temperatures will be used extensively in the new world of technology. Let us take a look at some of these developments.

The temperature of the liquid oxygen used as rocket fuel, cold as it is, is not the lowest temperature useful to man. Even lower temperatures are employed to cool special amplifiers known as masers which, in radio telescopes, help in the detection of high-frequency radio waves. These waves reach the earth as weak signals from distant stars or from the echoes of man-made signals that have been sent to the moon, man-made satellites, and planets. Partly because the masers are cooled down to −452° F., the temperature of liquid helium, they are ultrasensitive and also cause little extraneous noise in the detecting system.

Another important use of low-temperature science is in the testing of metals. Today, in various types of technological applications, the purity of metals is highly important, and metallurgists need simple techniques to test this purity. It is possible to determine the amount of impurity in a metal by measuring its resistance to the flow of electricity when it has been cooled to almost 0° K., where molecular motion is almost entirely stopped and there is little resistance, except by impurities, to the electric current. Within a few years, commercial metal users may place on the products they buy specifications as to the maximum permissible electrical resistance at liquid-helium temperatures.

An even more exciting application of low temperatures results from the loss of *all* electrical resistance (superconductivity) at low temperatures. Many metals, alloys and some compounds become superconducting at these temperatures, although none has yet been found to be superconducting above 19° K.

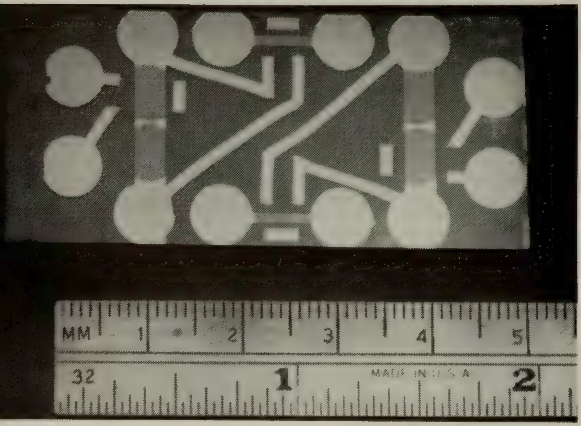
Before surveying the uses of superconductivity, we must know a little more about the properties of superconductors. Besides losing all electrical resistance, a superconductor also expels all magnetic field from its interior. (A magnetic field is the field of force around a magnet; it is what pulls some metals toward a magnet.) A superconductor is therefore a perfect shield against magnetic fields. However, if the intensity of a magnetic field becomes too great, the superconductor can no longer act as a shield. Magnetic field penetrates the material, electrical resistance returns and superconductivity is destroyed. (See Figure 1.) These properties of superconductors are used in two major ways: to build computer elements and frictionless bearings.

Superconducting computers, which are located in cooled containers, are not being sold commercially, and possibly none will ever be used for routine business purposes. They will have, however, many military and other specialized uses. Superconductors are used in computers as switches and memory units, greatly reducing size and increasing speed. The simplest switch is formed by winding a coil around a central superconducting wire. A large current through the coil destroys the superconductivity of the central wire, and this state corresponds to the "off" position of the switch. The "on" position corresponds to the state in which the central wire is superconducting. This type of switch and variants of it are called cryotrons. Memory units can be made of superconductors also. A current of electricity is induced to flow in a loop of superconducting wire. Because the superconductor has no resistance to electric current, the current will continue to flow around and around the loop. The superconducting loop "remembers" that a current was induced in it and preserves this memory until its superconductivity is destroyed by a high, impressed magnetic field. Most computer devices are formed from thin films of superconducting materials arranged in complex patterns. A simple computer circuit made from films is shown in Figure 2.

A second major application of superconductivity—frictionless bearings—depends on the expulsion of magnetic fields from a superconductor. A superconducting sphere, for example, can be suspended in space by a proper arrangement of magnetic fields around it. The superconductor, in a sense, so badly wants to exclude the magnetic field that it will "disobey" gravity to do so. The magnetic fields cannot be too large, of course, or superconductivity is destroyed. The load-bearing capacity of these bearings is therefore limited. Since bearing friction is a major source of error in gyroscopes, superconducting bearings are being used to develop more stable gyroscopes.

Very low temperatures may, in the future, be used in connection with infrared devices in missiles, antimissile missiles, superconducting lens shielding for electron microscopes, and biological freezing processes. A whole new area of technology is opening up, and scientists and engineers will inevitably create now unforeseen low-temperature applications.

PHOTOS, GENERAL ELECTRIC RESEARCH LABORATORY

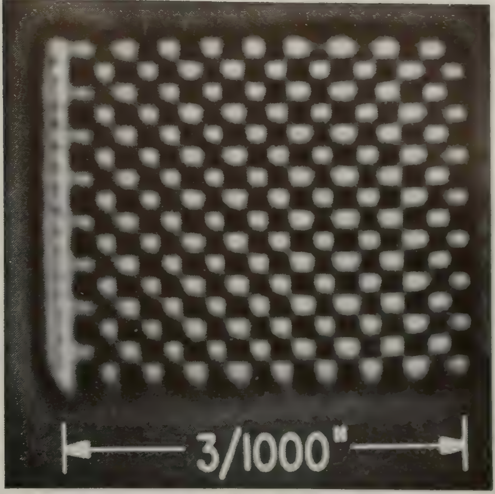


This picture of part of a superconducting computer circuit shows how miniature, complex patterns of thin superconducting films are arranged to form part of a computer circuit. This particular circuit can replace four to eight electron tubes.

The Promise of Thermoplastic Tape

By NORTON RUSSELL

Free-Lance Writer



This pattern recorded on thermoplastic tape is about three thousandths of an inch in length. Forty million "bits" of information can be recorded on one square inch of tape.

SINCE early times, man has felt the impulse to record his experiences, preserve what he has learned and perpetuate his impressions of his surroundings in visual images. Much of his early effort has, of course, been lost to succeeding generations. Only such laborious records of ancient eras as Egyptian hieroglyphics and paintings, carved or painted on rock, remain for us today.

In our own time the quest for knowledge and the means of recording it have accelerated at a fantastic pace. So great is the volume of information that a scientist reading full time would find it hard to keep abreast of new developments even in his own specialized field. This accumulation of knowledge is increasing at an even more dizzying rate as we reach out to probe the mysteries of the universe and at the same time continue to unlock the secrets of the minuscule world of the atom.

Hand-in-hand with accumulation goes dissemination—the broader sharing of information through exchange of the written and spoken word or visual image. Man would find himself hopelessly buried under an avalanche of his own creation had he not made it possible to record, analyze and transmit with almost lightning speed his rapidly growing store of knowledge. This has been accomplished by a series of inventions, of which the most recent ones are largely in the field of electronics. They include computers, tape recorders, video tape and other developments. One of the newest is TPR, thermoplastic recording, devised by Dr. William E. Glenn at the General Electric Research Laboratory in Schenectady, New York.

TPR is exactly what its name implies—an electronic device for recording, storing and reproducing photographic images and technical data on plastic tape that is responsive to heat. Electronic recording of images and data is done with an electronic "pencil"—a beam of electrons. This bare-bones description does not begin to suggest TPR's flexibility, adaptability, lightning speed and capacity for compressing information—characteristics that open up broad possibilities for practical future applications.

Perhaps the easiest way to grasp the differences between TPR and magnetic tape is to recall that in the case of magnetic tape the electronic pattern is held in position on the iron-oxide surface and may be reproduced electronically. In the thermoplastic method, however, the pattern becomes physically a part of the tape itself and can be projected optically, on a screen with a projector, as well as electronically.

Here, briefly, is how TPR works. The original image is first photographed electronically by a TV camera. The photograph is then reproduced on a moving, three-layered tape by an electron beam that sprays on its electronic pattern line by line. The density of the light and shaded areas in the photograph varies the pattern of electron charges on the tape. This operation must take place in a vacuum, but that presents no serious problem as the necessary conditions can be created in about one minute.

At this stage the electronic pattern exists on the surface of the three-layered tape. A bottom layer, very much like a narrow motion-picture film, gives the other two a stable base. A middle, or conductor, layer is positively charged, and the top, or recording, layer is negatively charged.

As soon as the tape has moved past the electronic "pen," the top layer of the tape is melted electrically. Attracted by the positive charges in the layer below, the pattern of the negative electrons sinks into the tape far enough to form physical grooves and ridges like those on a phonograph record. When these grooves reach full depth the tape is cooled and the pattern assumes permanent physical form. Images can be recorded either in black and white or in full color.

By use of a special optical system the film can be viewed at once by being visually projected on a screen, or it can be transmitted for immediate viewing on a television screen.

TPR can record images with the same, almost instantaneous, speed as photography. Yet it does not require the same laborious and time-consuming chemical processing.

The tape can be erased and made ready for re-use at any time simply by heating it; the original charges leak away and surface tension smooths out the surface.

At present, 16-millimeter film is used for the base tape. The width of the image in the larger-sized recordings, however, is only five millimeters. This is about half the width of the standard audio-magnetic tape.

Even at its present stage, TPR can concentrate almost one hundred times as much information in a given space as can magnetic recording. By way of illustration, TPR could record the thirty volumes of *The Encyclopedia Americana* at the rate of a volume a minute, a page at a time as does microfilm, and then store the entire contents on a spool no bigger than one that holds the ordinary typewriter ribbon.

TPR is a simpler process than magnetic-tape recording. It eliminates the need in certain situations for highly complicated equipment, and it is potentially a cheaper process as well as a more convenient one for some uses.

Let us examine a few of the fields in which TPR should find most significant future applications.

Motion-picture and television reproduction. Because TPR can be viewed on a screen, erased and re-recorded instantaneously, it will enable television and motion-picture producers to edit while shooting is in progress, to study takes from various camera angles and to eliminate mistakes by erasing. Magnetic video tape is limited in its use because it requires cumbersome and expensive equipment. Thermoplastic tape may eventually provide a much more flexible and practicable substitute, which could bring the viewer broader world coverage than now is possible either by tape or film. It also suggests the possibility of special optical effects synchronized with live or filmed production.

Radar. Radar data in the past have either been plotted by hand or copied photographically. Both of these methods involve delay. TPR would make it possible for the signal to be recorded on tape, developed and projected to any desired location, all within a fraction of a second and without appreciable loss of quality or detail. In addition to extending the range, it could also help to distinguish targets from random signals that appear as noise on the screen.

Aerial reconnaissance. Photography and recording from the air can be greatly refined and speeded up through the instantaneous monitoring or "read out" that TPR makes possible. On-the-spot evaluations can be made and retakes ordered while the reconnoitering planes are still in flight. Processing delays in putting the information to use also can be eliminated.

Missile guidance. By the use of map-matching techniques, TPR tape can be used to correlate the flight of a missile with the programed path, right up to the target. Tape containing a pre-programed path is incorporated in the missile.

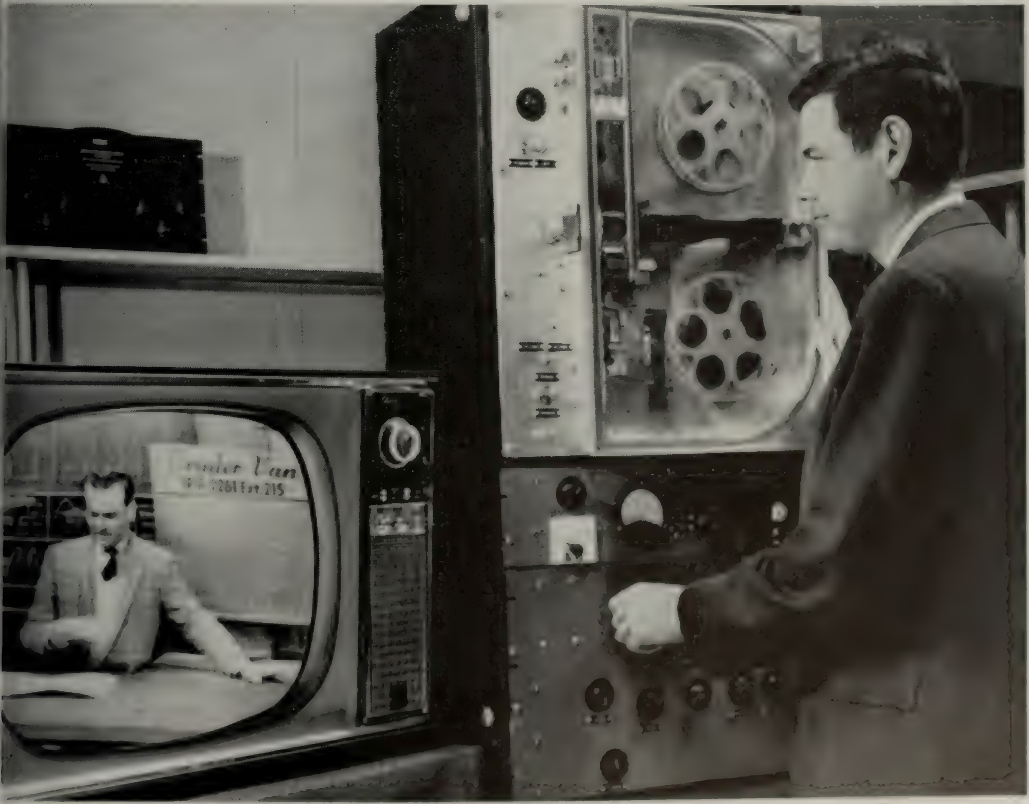
Satellites and space vehicles. Weight, compactness and ability to transmit, erase and re-record on the spot all vitally affect the scope and usefulness of data available from a satellite in orbit. In view of this, TPR would seem to be an ideal means of increasing the value and extent of information telemetered from outer space.

Computers and data processing. Because of its speed in recording and projecting data, and particularly because of its ability to store information compactly, TPR should be useful in rapidly expanding systems for electronic handling of information. The color system developed by Dr. Glenn also seems well-adapted to certain specialized requirements of much data processing.

Although production schedules have not yet been announced, TPR already holds promise as a useful new tool for coping with rapidly growing needs in handling and exchanging data in industry, government and communications.

The inventor operates the thermoplastic recorder which transforms a television signal into a series of tiny wrinkle patterns in a plastic-coated transparent tape which later can play back the original image.

PHOTOS GENERAL ELECTRIC



THE WANKEL ROTATING COMBUSTION ENGINE

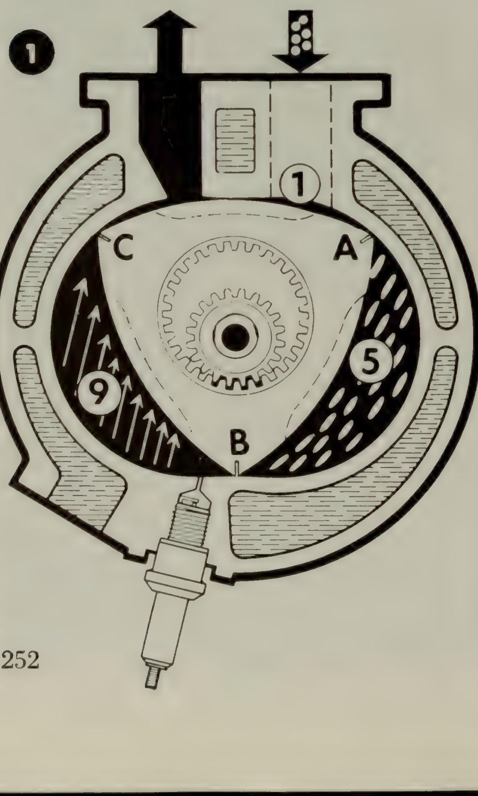
By DIANA BARTLEY

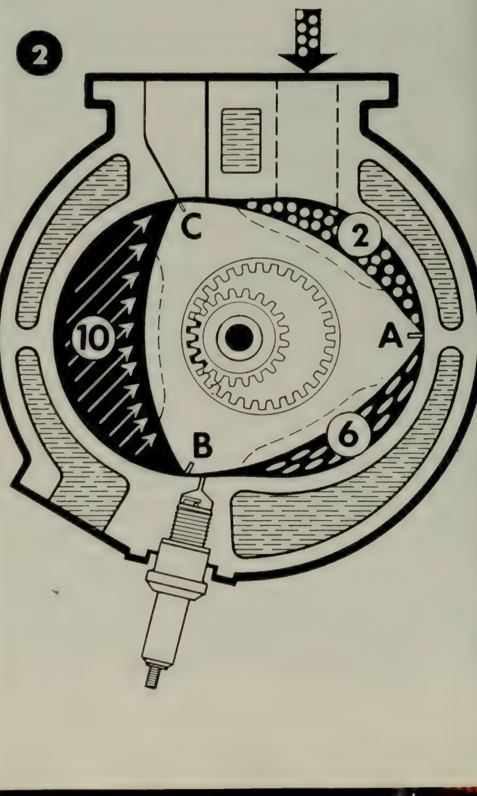
Automotive Journalist

FELIX WANKEL, a German inventor and mathematician, made his first rough sketches of a rotary engine in the spring of 1954. He was not proposing a new concept, for various designs for rotary engines had been seriously suggested during the preceding hundred years or more. Wankel was, however, setting himself a difficult problem, the successful solution of which seemed highly unlikely. Not one of the several hundred different rotary-engine designs that had been patented in the previous sixty to seventy-five years had proved to be practical in actual operation. Inventors kept trying, nevertheless, despite the ever-growing precedent of failure. This is understandable because, in theory, a rotary engine offers many advantages over all the reciprocating engines (piston engines) in common use today, for everything from automobiles to pumps for fire hoses.

In the standard piston engine, the pistons go up, stop, then come down; valves plug and unplug inlet and outlet holes in each cylinder; and a multitude of other parts, including connecting rods, camshafts, valve lifts and rocker arms, all work away at a tremendous rate. They racket up and down, back and forth, round and round, producing a great deal of useless vibration and commonly creating enormous stresses on many of the engine components.

The rotary engine does away with all this inefficient complexity; the engine's heart is some sort of "piston" or rotor,





rotating in a sealed chamber. In most rotary engines there are incorporated one or two pieces rotating inside a chamber, uncovering and re-covering inlet, spark and exhaust ports that are placed somewhere on the circumference of the chamber. Each explosion of the compressed fuel-air mixture theoretically adds impetus to the rotating part, giving it another push in the direction in which it is already rotating. The rotating part is connected by simple gears to the crankshaft.

All the inventors of rotating combustion-chamber engines were trying to design a power plant that would, in actual operation, be all the things it promised theoretically to be. It gave promise of being simpler, cheaper, quieter, vibration-free, more efficient and thus smaller and more economical than reciprocating engines producing a similar amount of

The Wankel engine working cycle is directly analogous to the four strokes of a standard piston engine.

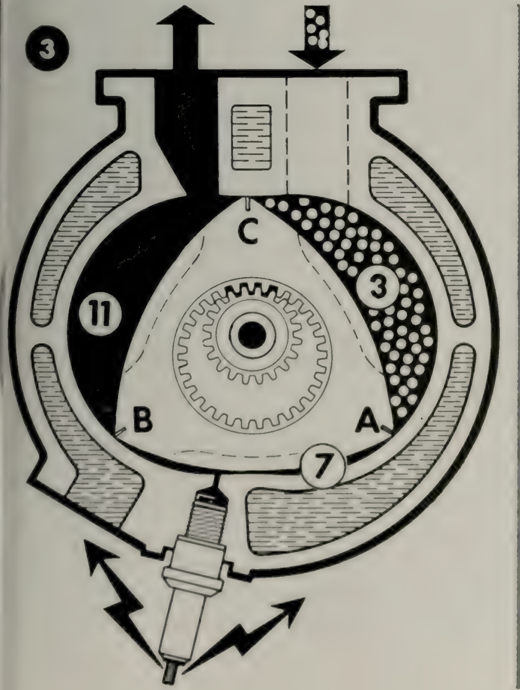
First, the induction "stroke": Beginning with **Figure 1,** follow the chamber formed by the C-A side of the rotor and the inside wall of the casing. In **Figure 1,** the chamber is at its minimum size ① and rotor-tip A has just uncovered the inlet port from the carburetor so that fuel-air mixture can enter the chamber. In **Figures 2** and **3,** the chamber becomes larger and larger, ② and ③, until it has reached maximum size, ④ in **Figure 4,** and rotor-tip C comes around to close off the inlet port.

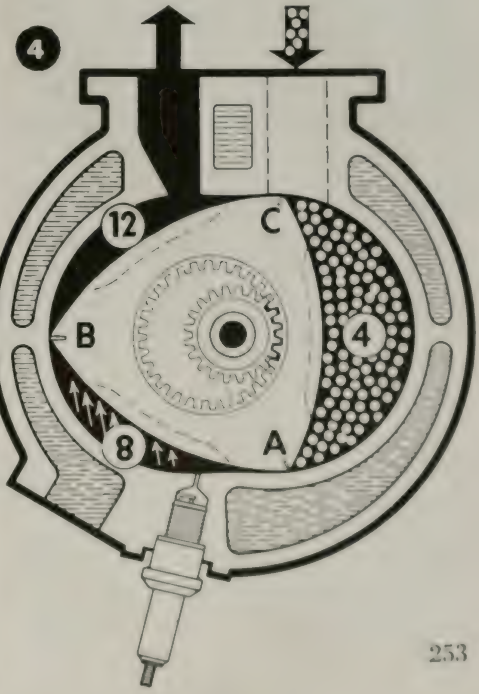
Second, the compression "stroke": Follow the diminishing-in-size chamber formed by rotor side A-B and the housing. In **Figure 1,** rotor-tip A has closed off the inlet port and the chamber is already lessening in size, ⑤. As shown in **Figure 2,** it becomes smaller, ⑥, until it is again at its minimum size, **Figure 3,** ⑦, when the fully compressed fuel-air mixture is ignited by the single spark plug.

Third, the expansion, or power, "stroke": In **Figure 4,** it can be seen that the burning fuel exerts its force against the A-B side of the rotor, forcing it to continue around in the same direction in which it is already moving and enlarging the chamber in the process, ⑧. In **Figures 1** and **2,** the burning gases exert force against rotor side B-C and the chamber, indicated by ⑨ and ⑩, grows larger and larger as the gases expand until rotor-tip C uncovers the exhaust port.

Fourth, the exhaust "stroke": In **Figure 3,** with the exhaust port opened, the burned gases begin to escape, ⑪. The chamber becomes smaller again as rotor-tip B follows around to sweep it clear of exhaust gases, ⑫ in **Figure 4.** In **Figure 1,** rotor-tip C is just about to close off the exhaust port as a new cycle begins.

Because each of the three chambers formed by the three sides of the rotor and the inner wall of the housing are constantly at some stage of this cycle, it can be seen that each full, 360-degree revolution of the rotor provides three power impulses. The gearing is such that the crankshaft thus revolves three times for each full turn of the rotor.





power. They all failed, mostly because they could not figure out a way to hold the moving rotor tightly against the inside wall of what was usually an odd-shaped chamber. A tight seal had to be maintained, a seal as tight as that provided by an ordinary piston ring for a piston moving up and down in a cylinder.

Wankel did not fail. During World War II and the postwar years he had solved valve-sealing problems for aircraft manufacturers. He used this experience in his work on his rotary engine to design an entirely different method of holding the tips of the rotor against the inside of the chamber. His mathematical genius was responsible for the selection of the unlikely but brilliantly conceived chamber shape for his rotary engine. He had arrived at a mathematically proved, logical, new design that theoretically would work. But this point had been reached by many rotary-engine designers before him.

Because he had already worked in collaboration with NSU, a German manufacturer of small cars, Wankel took his design to this company. For three years he and Dr. Froede, chief of NSU's research department, worked over the detailed drawings. Finally, in February 1957, they built the first experimental model. It ran well indeed, under very severe tests. The tiny engine was only 9½ inches in diameter and 7 inches wide. It operated easily, without serious cooling problems, and proved the durability of its mechanical parts by sustaining a 25,000 rpm (revolutions per minute) speed. It idled smoothly at 700–800 rpm and produced 29 B.H.P. (brake horsepower) at 17,000 rpm. Most important of all, it proved that Wankel's method of maintaining a tight seal was eminently successful.

There were, however, difficulties with this first engine. Because both the rotor and the inner chamber moved, the engine was exceedingly complex and presented serious problems with intake, exhaust and ignition. It was decided to make the inner chamber stationary, whereupon it became the inside wall of the housing. The inherent balance thus lost was compensated for by the addition of counterweights or flywheels attached to the crankshaft outside the engine casing. A year later, in 1958, new experimental models, incorporating these design changes, but still water-cooled, were built and proved to be an enormous improvement. This design was arrived at only four years after Wankel had his new idea and after only one year of actual experimentation. It is essentially the layout being used by both NSU and by the American Curtiss-Wright Corporation, which in 1958 signed working agreements with NSU. Curtiss-Wright is to develop the engine in sizes suitable for use in American cars, small planes, motorboats and in certain industries.

Wankel's engine has two essential moving parts—a rotor and the crankshaft to which the rotor is connected. The rotor is a thick "slab" shaped like an equilateral triangle, with bulging sides and a large hole in the middle. A ring of gears is attached around one end of the inner circumference of this hole. This gear ring meshes with another that is fixed to the housing. In the center of the hole is the crankshaft, to which is attached an eccentric piece, a large lump of metal, in effect a cam lobe, which fills all the rest of the hole. It is therefore forced to go around as the rotor does. In the NSU Wankel engines, the crankshaft is forced to revolve three times for each full 360° revolution of the rotor. The motion of the rotor, more or less like that of a hula hoop in action around the waist of a child, results from the oval shape of its chamber, which has a slight inward dent on each side. The geometry used to calculate this simple shape is complicated, as it involves curves made by rolling a point on the outside of a circle. The "squashed-circle" shape is an unusual example of a family of geometric shapes called epitrochoids.

Despite the eccentric movement of the rotor, all three of its tips are in constant contact with the inside wall of the chamber. They divide the interior space into three separate chambers, well sealed off

ILLUSTRATIONS, NSU

Dr. Froede, chief of NSU's research department, is shown holding the Wankel rotating combustion engine that is being tested in NSU Prinz cars.

from each other. Each chamber is continuously enlarging and diminishing in size and altering in shape. The inlet from an ordinary carburetor is positioned so that when one of the rotor tips uncovers it, the air-fuel mixture is drawn into the enlarging chamber—the equivalent of a reciprocating engine's piston on its intake stroke. The chamber reaches its maximum size just as the second rotor tip follows around to close off the inlet port. The movement of the rotor then compresses the mixture, a single spark plug ignites it and the expansion of the burning gases forces the rotor around properly in the direction in which it is already moving. (See figures 1–4.)

Rotor seals are, in NSU rotary engines, made of high-tensile cast iron and serve the same purpose as ordinary piston rings in a piston engine. There is a slot at the apex of each rotor tip into which the thin metal seal is inserted. The seal can slide a bit in its slot, the clearance between it and the sides of its slot being about .001 inch. The slight pressure exerted by the beryllium springs located at the inside end of the slot, the pressure of gases in the combustion chambers and the centrifugal force set up by the rotor all combine to hold the seal snugly enough against the inner wall of the housing and against the sides of its own slot to seal off each chamber effectively. Yet it is not held so tightly that the sliding seal or the rotor itself will seize the engine. The end seals, which follow the arcs of the bulged rotor flanks and hold the flat end plates of the rotor against the housing, are designed on the same principle but are less critical.

Since 1958, when it was proved that Wankel's rotary engine was practical, development has continued at a rapid rate. Rarely has a new invention, especially one attacking the multitude of problems inherent in obtaining useful power from the burning of fuel, progressed so fast. It is not being overly optimistic to think that the Wankel engine will disprove the theory, long held by engineers and manufacturers, that an enormous gap must necessarily exist between the time when a mechanical design is fully proven in tests and the time when it can be incorporated in mass production of, say, automobiles. Turbine engines have been successfully used for some years now to power ships and airplanes. Yet after almost ten years of intensive research by such companies as General Motors, Chrysler, Ford, Rover of England, Renault of France and Fiat of Italy, an automotive turbine that can compete in performance and cost with the standard automotive reciprocating engine is not yet a reality. NSU has had two Wankel-engined NSU Prinzes under test on the highways of Europe for more than a year. In addition, Curtiss-Wright, which has contributed a number of design improvements, has built Wankel engines of various sizes, all of which have now had thousands of hours of testing. These advances have occurred within five years of the time when the radically new design was conceived and within three years of the very first experimental model.

Wankel and NSU very quickly solved most of the basic problems. The Wankel engine has only one major inherent limitation—size. If made too small, it would present a difficult manufacturing problem. And the fact that the speed at which the rotor tips move is critical makes very large sizes impractical, at least at this stage of development. Beyond this, refinement of the design is all that remains to be done; and this is not any more difficult than the redesigning of an already existing reciprocating power plant.

New transmissions are being designed that will allow the engine to utilize its full high-speed operation. Its potential is severely limited when it must deliver power to the rear wheels through existing automotive gearboxes such as those in the Wankel-engined NSU Prinz. In fact, the Wankel engine produces power over such a wide rpm range that it is reasonable to believe that it will need no transmission at all, sometime in the future.

In fact, the Wankel engine is just about everything a century of disappointed rotary-engine designers had hoped for.

It is perfectly balanced. Even skeptics who have ridden in the Wankel-engined NSU's have described the lack of vibration as "uncanny." A glass of water sitting on a high-revving Wankel engine shows not even a ripple.

With only two basic moving parts, it has all the advantages of simplicity and ease of manufacture that simplicity implies. It is inexpensive to build for many other reasons. The absence of especially fine tolerances means that no special machining methods are required and no expensive metals are needed. Most of the existing Wankel engines are of plain cast iron.

The engine is extraordinarily versatile and, in its present form, can be used to power everything from lawn mowers to small airplanes.

It has excellent acceleration, can sustain very high rpm and thus produce corresponding high power output for indefinite lengths of time. This, at present, is an attribute of only the most highly developed, fragile and enormously expensive piston engines built for race cars.

Although it uses more fuel when run at part throttle, its over-all fuel economy is, right now, as good as that of equally powerful piston engines.

Mainly because its internal temperatures are relatively low, the major problems that high inside temperatures cause in all piston-engine designs simply do not exist in the Wankel engine.

Though limited in maximum size, Wankel engines can be "stacked" to great advantage. Piston engines cannot be "connected" to each other simply and, when they are, commonly suffer a 50-percent loss of power. But four Wankel engines, for example, easily can be put together and attached to the same crankshaft, which will then deliver four times as much power as with a single engine.

Even in cast iron, a Wankel engine produces one horsepower for each pound of its weight, a power-to-weight ratio that equals that of modern piston aircraft engines. Curtiss-Wright expects to double this in its larger Wankel engines. A four-cylinder automotive piston engine of light alloy is considered an excellent design if it produces one horsepower for each 2.3 pounds of weight, and the most expensive race-car engines have a power-to-weight ratio of 1.2:1.

It has not been decided whether the cubic volume of one of its three chambers, or the total volume of all three, is to be used to define the size of the Wankel engine. If the former is chosen, the units used in the NSU Prinzes are producing 3 H.P. per cubic inch of capacity. And even if the latter is taken as a basis, the current experimental Wankel engines are producing slightly better than one H.P. per cubic inch—which is still considered a laudable output for a fine piston engine. The tiny Wankel unit, smaller than either the gearbox or the cooling system and almost obscured under the generator and carburetor, produces 45 horsepower.

Lastly, the Wankel engine, with its compression ratio lowered from that required for running on high-octane fuel, will run just as happily on low-grade Diesel fuel oil.

Already the equivalent of the best modern piston engines as regards fuel consumption and power and, even in its current experimental stages offering a great number of other advantages, the Wankel engine appears to be a truly impressive invention.

The Year in Space

By JAMES J. HAGGERTY, JR.

Editor, Aerospace Year Book

THE year 1960 was a very active one in the allied fields of space exploration and guided missilery.

In space, an intensified launching schedule on the part of the United States brought forth fourteen successful orbiting satellites, practically all of them of a more "sophisticated" nature than the early satellites of 1958–59. The Soviet Union, apparently still pursuing its policy of major "milestone" launchings rather than quantitative space experiments, orbited only three vehicles during the year, but the three shots were spectacular from the standpoint of public interest. (We shall discuss these shots in more detail in a moment.)

There was a feeling, however, in American scientific circles that the United States had regained a good deal of its lost prestige because of the variety and scope of its 1960 program. This program included communications, navigation and meteorological satellites, recovery-after-orbit tests and significant steps toward putting man in space.

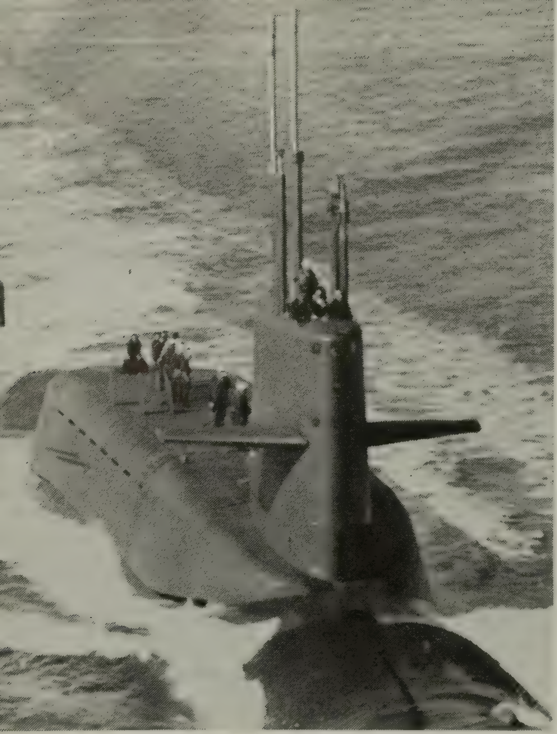
Considerable progress was made during the year in the field of guided missiles, notably in the area of long-range, thermonuclear weapons. The first American intercontinental ballistic missile squadron was brought up to full strength, two more advanced ICBM's approached operational status and the first water-launched ballistic missile was introduced to operational service with the fleet.

Perhaps the most significant "first" of the year fell to the Soviet Union. This was the first recovery of animals from an earth orbit, accomplished with a vehicle known as Sputnik V, on August 20. Sputnik V was a two-section vehicle weighing slightly more than five tons. One instrumented section, not designed for recovery, contained mice and rats. The other section, the recovery capsule, contained two dogs, a dozen mice and packages of insects and plant life.

Re-entry was triggered from the ground during Sputnik V's eighteenth earth orbit. The non-recoverable section burned up from friction heat as it entered the atmosphere, but the recovery capsule was safely brought down by parachute, its living occupants unharmed. The experiment was considered significant because it demonstrated that Soviet technology had mastered the difficult re-entry problem, the most important preliminary step toward manned space flight. The Soviets repeated the animal experiment on December 1, again with two dogs and other animal and plant life aboard. The orbiting vehicle, which the Soviets said weighed five tons, was apparently similar to Sputnik V. The orbit ranged from 115 to 164 miles from earth.

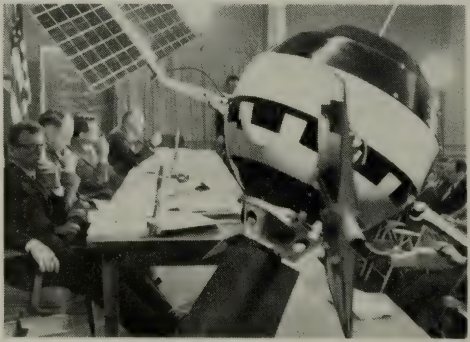
Earlier in the year, on May 15, the Soviets launched a less successful but nonetheless spectacular space vehicle, alternately known as Sputnik IV and Spacecraft I. This vehicle contained a space capsule designed for human occupancy, and a dummy space man was placed aboard. According to the Soviet press the capsule functioned perfectly while in orbit but an attempt to recover it failed. The vehicle apparently exploded after triggering of the signal for re-entry.

The United States, in a very successful year, accomplished a number of "firsts" of its own. Although the Soviet Union was the first to bring living beings back from orbit with Sputnik V, the United States was first to recover an object from space orbit. This was accomplished by



The nuclear submarine George Washington can carry sixteen Polaris (intermediate) missiles.

With a hook an Air Force C-119 plane snatches the Discoverer XVII capsule over the Pacific.



Duplicate of the Pioneer V launched into solar orbit. The "paddles" contain solar batteries.

Discoverer XIII, one of a series of short-life satellites launched by the Air Force for the sole purpose of attempting recovery. Launched on August 10 from Vandenberg Air Force Base, California, the 300-pound recovery capsule was picked up in the water near Hawaii about 30 hours after firing. During its seventeenth earth orbit the re-entry pattern was initiated.

On August 19 the capsule of Discoverer XIV was recovered in mid-air by an Air Force C-119 Flying Boxcar, the first time such a feat had been accomplished.

In September another Discoverer capsule (XV) was brought back to earth after orbit and sighted in the ocean 1,000 miles south of Hawaii. Recovery was impossible, however, due to rough seas. In November came a second spectacular event in the Discoverer series. Discoverer XVII accomplished a successful re-entry and was snatched in mid-air by a C-119 specially equipped with a long, trailing hook designed to snag the capsule's parachute. A third mid-air recovery was made with Discoverer XVIII on December 10.

Thus the Discoverer program, started early in 1959, paid off with four successful recoveries after a long series of setbacks, although 12 of the 18 Discoverers achieved orbit. Launching vehicle for all of the Discoverer shots was the 78½-foot Thor-Agena, which consisted of a Thor intermediate-range ballistic missile as the first stage, topped (except in the case of Discoverers XVI, XVII and XVIII) by the Agena A, a combination of second propulsive stage and satellite. In each successful firing the entire Agena A, weighing 1,300 pounds, went into orbit. The recovery capsules, weighing from 195 to 300 pounds, were part of Agena A. The launching vehicle for Discoverers XVI, XVII and XVIII was the Thor-Agena, topped by the Agena B instead of the Agena A used in the other Discoverers.

A very important United States project from the standpoint of international prestige was Echo I, launched on August 12, a day after Discoverer XIII was recovered. Echo was a legitimate scientific experiment as a communications reflector, but its wide interest stemmed from

PHOTOS THESE PAGES WIDE WORLD

Polaris shot. The nose of the underwater missile (top) emerges from its launching tube shrouded in bubbles. The foreground objects are fish.

the fact that it was the first space satellite that could be seen by the naked eye as it coursed around the earth.

Echo was a plastic balloon 100 feet in diameter, which inflated automatically after injection into orbit. It was covered with an aluminum coating which reflected the sun's rays, permitting naked-eye visibility from earth. Echo was placed in a 900-mile-altitude orbit, circling the earth every 122 minutes. It was launched by a Thor-Delta vehicle which employed the Thor missile as first stage, a 7,500-pound-thrust liquid-propellant rocket as second stage and a 3,000-pound-thrust solid-fuel rocket as third stage.

Echo was a "bounce" satellite, that is, it provided a reflector in space by which messages could be relayed from one point on earth to another. The aluminum coating that permitted visibility also provided radio-wave reflection. The National Aeronautics and Space Administration, sponsoring agency for Echo, "bounced" a message (the voice on the taped message was that of President Eisenhower) from one of its stations at Goldstone, California, to another station at Holmdel, New Jersey, on August 12. A photo transmission was made a week later from Cedar Rapids, Iowa, to Richardson, Texas. Echo was the forerunner of more sophisticated communications satellites which may provide the answer to the threatened problem of saturated cable lines for overseas messages. Echo is a "passive" satellite, that is, it merely "bounces" messages from one point to another. NASA planned later experiments with "active repeater" satellites, equipped with instruments for receiving and retransmitting messages.

Another important United States space project in 1960 was Pioneer V, which achieved a significant first by transmitting data at a distance of 22,462,115 miles from earth. Pioneer V was not an earth-orbiting satellite, but rather a probe designed to investigate space between earth and its neighbor planet, Venus. Launched on March 11, Pioneer V went into an orbit around the sun with an aphelion (the point in orbit farthest from the sun) of 92,358,000 miles and a perihelion (point closest to the sun) of slightly less than 75,000,000 miles. The probe consisted of a 26-inch-diameter sphere with 43 pounds of instruments to measure cosmic radiation, magnetic fields and frequency of micrometeorite strikes as the vehicle moved through space.

The launch vehicle for Pioneer V was a three-stage Thor-Able vehicle. The Thor missile served as first stage, second stage was powered by a 7,500-pound-thrust liquid-propellant rocket and the third stage was a small solid-propellant rocket. The vehicle boosted the space probe to a speed of 36,500 feet per second, a velocity sufficient to allow it to escape the earth's gravity and coast into solar orbit.

During the year the United States launched the first meteorological satellites, named Tiros for Television Infrared Observation Satellite. Tiros I was launched successfully on April 1. It carried two television cameras which could be operated by radio command from ground stations when photographic conditions were right—for instance, when the area to be photographed was in sunlight. The purpose of the satellite was to take pictures of the earth's cloud cover as a means of more accurately predicting weather. Although only a crude prototype of future weather satellites, Tiros I was highly successful. It took and relayed to earth almost 23,000 photos during the 78 days during which its equipment functioned.

Tiros II, a more advanced version of the meteorological satellite, was launched on November 23. The 280-pound satellite contained the two cameras, two magnetic-tape recorders to store photographs for relay to ground stations and seven infrared detectors. Five of these "sensors" were used to photograph cloud cover at night, the other two to measure the earth's heat balance, which influences weather.

Tiros II's package contained more than 9,000 solar cells to provide power for the cameras and the transmitting equipment in the satellite. These cells were expected to provide power for about three months. Tiros II was also equipped with spin rockets which could be fired from the ground to stabilize the satellite and keep its cameras pointing earthward.

Tiros I was launched by a Thor-Able vehicle similar to that used for Pioneer V. Tiros II was boosted into orbit by the same Thor-Delta type of launcher used for getting the first Echo into its orbit.

Other major space achievements during 1960 included:

Launching of two navigational satellites as part of a continuing program to investigate the possibility of using satellites as a method of fixing positions of ships and aircraft. These satellites were identified as the Transit Series. Transit IB was launched on April 13; Transit IIA was placed in orbit on June 22. (An earlier Transit, IA, had been launched on September 17, 1959, but it failed to achieve orbit.) Both Transits were launched by a Thor-Able-Star vehicle, consisting of the Thor missile and a second stage of 7,900 pounds thrust called Able Star. The Able-Star stage was unique in that it could be restarted in space, the first rocket engine with this capability. The capability was successfully demonstrated in Transit IB. Transit IIA was also unique in that it carried, in addition to the navigational satellite, a "passenger" satellite designed to investigate solar activity. This was the first time a single vehicle had ever launched two satellites.

Launching of a prototype missile-detection satellite called Midas II (Missile Defense Alarm System). Launch vehicle was an Atlas-Agena, consisting of an Atlas ICBM as first stage and the Agena A, with a 15,000-pound-thrust liquid-propellant rocket engine, as second stage. In this firing the entire Agena stage was placed in orbit. The design purpose of Midas II is to detect the launch of enemy missiles by infrared sensing. In the Midas II launching of May 24 the purpose of the test was to check out the ability of the infrared detectors to pick up the heat of test flares on the ground. Midas performed well in this respect, but the telemetry system (the transmitting equipment that sends instrument readings back to earth) failed on the second day after Midas went into orbit. The Agena A that carried the Midas equipment was one of

DOUGLAS

Drawing of the Echo at the moment of release. The aluminum-coated, plastic balloon is inflated to its full diameter of one hundred feet in two seconds.

the largest American vehicles placed in orbit; it weighed 4,500 pounds.

A step-up in the flight-test program of the X-15 rocket-powered research airplane spacecraft. Using a relatively small interim-rocket power plant, the X-15 set new unofficial records for speed (more than 2,300 miles per hour) and altitude (more than 136,000 feet). These marks were expected to be shattered time and again, however, as the X-15 was prepared for a new test series with a much more powerful engine, called the XLR-99. This engine delivers close to 60,000 pounds of thrust and is capable of driving the X-15 to altitudes of more than 50 miles and to speeds of Mach number 6, six times the speed of sound or about 4.000 miles an hour at high altitude. First flight tests were made with the new engine, although speed was deliberately held down. The test program called for boosting speed and altitude gradually during 1961, with very high-speed and altitude runs scheduled for the latter part of the year.

The National Aeronautics and Space Administration's program to put man in earth orbit, Project Mercury, gained momentum during the year with a series of successful tests designed to check out the "hardware" (primarily the launch vehicle, the escape system and the space capsule). At year's end, NASA was preparing for a big step prior to manned space flight—launching of a chimpanzee in the Mercury capsule on a "suborbital" flight. A suborbital flight is one in which the capsule does not go into orbit, but follows a ballistic trajectory like a missile, moving briefly into space to an altitude of about 120 miles. The next major step in Mercury was to launch one of the seven astronauts on a suborbital flight. Assuming success in the chimpanzee test, the manned suborbital mission was to take place about March 1961. Manned orbital flight was scheduled for the latter part of 1961, provided all intermediate tests proved successful.

NASA also announced plans to follow Project Mercury with a more advanced "multi-man" spacecraft. Called Project Apollo, this vehicle could carry three men in earth orbit as a scientific observatory in space, or it could take two men around the moon and back to earth. Apollo is part of a ten-year NASA space program announced during 1960. Other projects in this program included Project Ranger, designed to land a 300-pound instrument capsule on the moon; unmanned space probes to Mars and Venus; and a "soft," or rocket-cushioned, landing of an instrumented space station on the moon. Manned moon landings, NASA said, would not take place before 1970.

The key to most of the missions in the ten-year program is Saturn, a huge launch vehicle with 1,500,000 pounds of rocket thrust. Saturn's engines were tested for the first time in 1960, and a launch of the lower stage was scheduled for 1961, but Saturn was not expected to be available for operational service before 1964.

On the missile front, notable progress was made on long-range missiles.

The Air Force's ICBM Atlas, which achieved limited operational status in 1959, became fully operational as the first squadron at Vandenberg Air Force Base, California, was completely equipped with missiles and trained crews. Construction was in various degrees of completion on eleven other Atlas launch sites.

The second ICBM, the Titan, entered the final phase of its test program, displaying remarkable reliability on most firings. It was scheduled to become operational in late 1961.

The second-generation ICBM Minuteman, which is powered by a solid-fuel rocket rather than the liquid propellants in Atlas and Titan, completed a series of "tethered" tests. In these tests the rocket engine was fired but the missile was restrained from flight by long nylon ropes. Eight tethered firings were made so successfully that ten additional scheduled shots were eliminated and the missile proceeded to the flight-test stage. First flight was scheduled for December 1960. Tests were also conducted on the Minuteman "train deployment" concept, in which it was planned to launch the missile from freight cars shuttling over the nation's railways. These tests were aimed at solving the logistics problem of handling the big missiles on railroad cars. They were also pronounced successful.

The Navy's Fleet Ballistic Missile Polaris, an intermediate weapon with a range of 1,200 nautical miles, became operational on schedule when the nuclear submarine George Washington joined the fleet in November with a full complement of sixteen Polaris missiles.

Other important missiles that achieved operational status during the year included the Air Force's Bomarc long-range air defense weapon; the Navy's surface-to-underwater Asroc, a short-range antisubmarine weapon; the Air Force Mace, a surface-to-surface pilotless bomber with a range of 650 miles; the Quail, a decoy missile used by B-52 bombers to confuse enemy radar defenses; the Navy's Bullpup, an air-to-surface, solid-fueled missile; and the Army's Lacrosse, a short-range artillery missile.

Probably the most important missile in development status was the Army's Nike-Zeus, a three-stage weapon designed to intercept enemy long-range missiles. A number of successful test shots were conducted during the year and important operational tests were scheduled for early 1961. In these latter tests it was planned to fire Atlas missiles several thousand miles from Vandenberg AFB to Kwajalein in the Pacific and attempt to shoot them down with Nike-Zeus units.

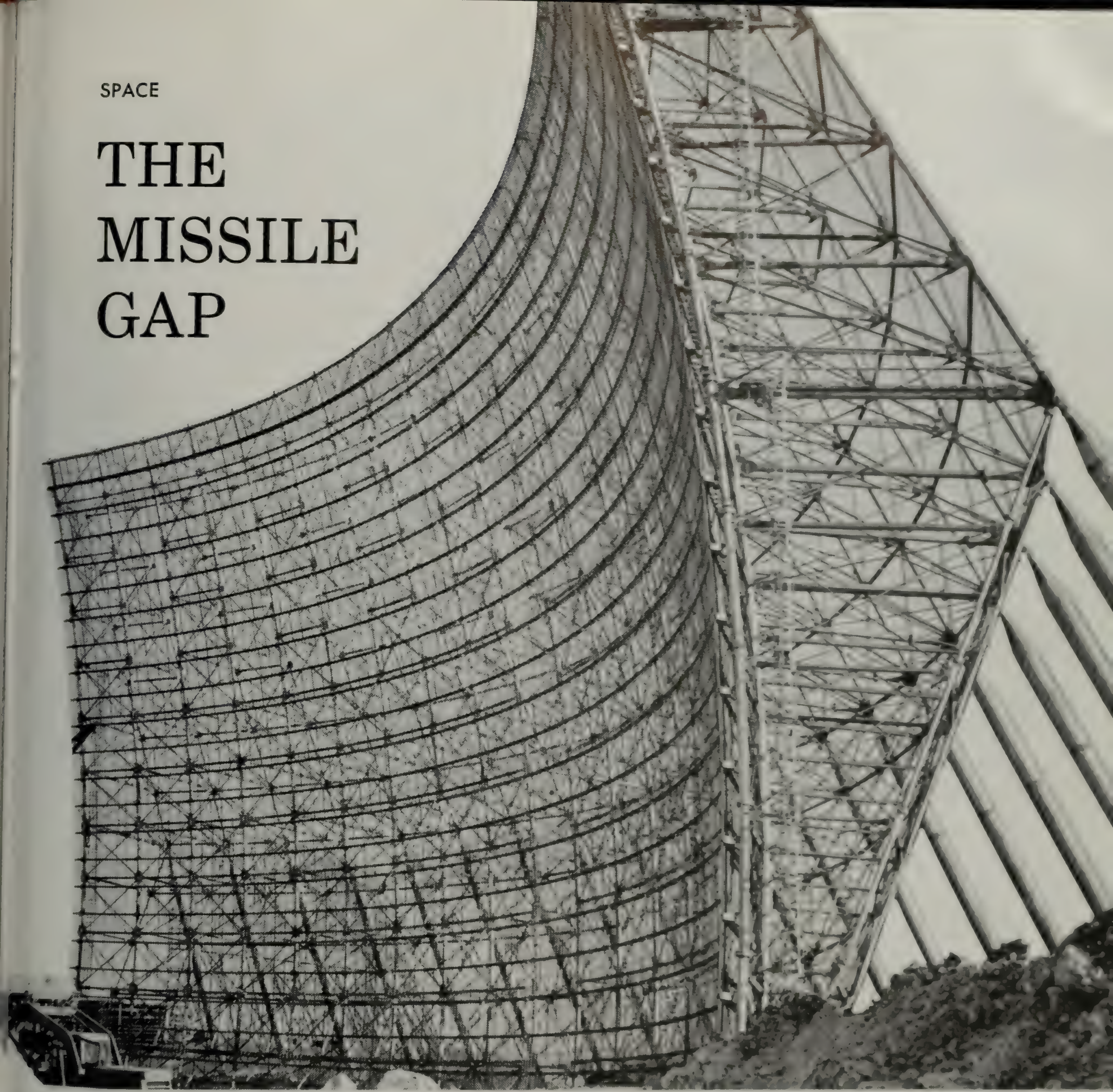
Other major developmental programs in advanced status included the Army's Pershing, a 500-mile-range battlefield missile scheduled for operational service in 1962; Subroc, a new 25-mile-range antisub weapon scheduled for fleet service in 1961; and Hound Dog, an air-launched missile to be used by B-52 bombers, expected to be in service early in 1961.

The Air Force started work on a major new missile program, the Skybolt. Skybolt is an air-launched ballistic missile, the first of this type, with a design range of more than 1,000 nautical miles. It will be launched from B-52's of the Air Force's Strategic Air Command.

Other missiles in early development status included the Navy's Eagle, a long-range (100 miles) air-to-air weapon; the Army's Mauler, an infrared-guided battlefield missile; the Redeye, a bazookalike missile to provide individual Army and Marine Corps troops with defense against low-flying aircraft; and the Navy's Typhoon, a ship-based antimissile missile.

SPACE

THE MISSILE GAP



GENERAL ELECTRIC

A giant BMEWS radar antenna reflector, seventeen stories tall, helps in the vital task of providing the United States Strategic Air Command with a fifteen-minute warning of approaching enemy missiles.

By GARRETT UNDERHILL

Author and Military Authority

EARLY in 1960 a major debate developed in the United States Congress and the American press over what many termed the missile gap. Concern had been building up ever since former Secretary of Defense Neil H. McElroy made a public statement in 1959 that disturbed many people. If, during 1961 and 1962, he said, the Soviets were to build all the intercontinental ballistic missiles believed possible, and the United States continued its ICBM program at the tempo then planned, the Soviets could at the beginning of 1963 have a 3–1 lead in numbers of ICBM's. The idea that the United States could ever be in a position of marked inferiority in such a major-weapons category understandably upset many Americans. Among them were Democratic leaders who had already been highly critical of the Eisenhower Administration. They felt that there was too great care for economy and too little concern with the provision of adequate national defense.

When Congress convened in 1960, these critics were permitted to quiz Government officials about the gap issue. The results caused many European observers to conclude that the major American defense advantage might not derive from mere weapons strength. Perhaps the country's truest defense, they pointed out, is the way in which its system of government permits controversial matters to undergo searching analysis and examination.

The debate admirably brought out the various and complex interrelated factors and factions involved in United States defense policy and plans. It amply demonstrated the checks and balances by which the American system of government insures that no one viewpoint can gain undue weight in the formation of defense policies.

As the persons concerned over the missile gap presented their point of view, it at first appeared that there might well be a good case for drastic action to offset the apparent Soviet-American ICBM imbalance. The keystone of the case was the testimony before Congress of Thomas S. Power, the four-star Air Force general who was chief of the Strategic Air Command, in charge of American striking forces of big bombers and ICBM's. What the General had to say shocked many. He bluntly asserted that the Soviets could, in a sudden, surprise attack, almost instantaneously knock out the one hundred bases from which the United States would have to launch any retaliatory action against Soviet military aggression. General Power stated that the Soviets could accomplish this with only 150 ICBM's to strike directly at the continental United States and with 150 intermediate-range ballistic missiles (IRBM's) to launch against United States installations in other countries.

General Power's statement keyed in with revelations made to Congress by Allen W. Dulles, head of the Central Intelligence Agency. Mr. Dulles said that official estimates indicated that the Soviets could have 140 to 200 ICBM's set for use by the end of June 1961. It was already known that American officials considered that the Soviets had many more than the 150 IRBM's they would require, in General Power's view, to score an initial knockout blow against his striking-force bases within range of such missiles. However, it quickly developed that General Power did not intend his argument to establish a case for a crash program to build more ICBM's.

In fact, Lieutenant General Bernard A. Schriever, head of the United States Air Force Research and Development Command, caused Congressional consternation by explaining that it was already too late to close the gap by ordering more Atlas missiles. And, he added, in 1963 there would be available a much better missile, especially for making missile bases less vulnerable to surprise attack.

What General Power wanted, instead of more missiles, was the means for protecting his bomber force from Soviet missile attack. He told Congress that American ability to deter the Soviets from attacking in the years 1960, 1961 and 1962 would "rest on manned bombers," of which the United States would have twice as many as the Soviets in 1961 and 1962. Missiles would begin to figure prominently in the American retaliatory force only when the new type was introduced in 1963. What most concerned the General was the lack of any system to give warning of the launching of Soviet ICBM's. The existing radar warning system could detect only manned bombers.

An entirely separate warning system was at that time, and is still, being built—BMEWS (Ballistic Missile Early Warning System). It is designed to give fifteen minutes advance warning of missiles that take as little as thirty minutes in flight. And a quarter of an hour is exactly the time needed for getting a combat-ready B-52 jet bomber into the air. Once airborne, of course, these bombers would be safe from any hydrogen-bomb attacks on their bases. Constructing BMEWS is a major undertaking: the initial three stations in Alaska, Greenland and England cost about $400,000,000 each, and the entire system will not be completed until 1963.

Therefore, to offset the missile gap, General Power advocated a "continuous air alert" during the three gap years, 1960, 1961 and 1962. He wanted to be in a position to have as much as a fourth of his approximately 500 huge B-52 jet bombers always in the air. There were then only twelve B-52's on air-alert status. The General asked for a supplementary appropriation of $571,000,000 to expand the air alert. This sum, he felt, would permit the purchase of additional spare parts needed to compensate for the extra wear on bombers flying much more than usual. It would also provide money for training extra crews to keep the planes flying.

In reply to General Power's argument the Administration vigorously defended its position. Its basic defense philosophy was set forth by President Eisenhower himself. He deplored the tendency to place any major emphasis on particular types of weapons, such as missiles. He was definitely against computing defense needs on the basis of relative numbers of weapons. All that the United States needs, he concluded, is enough missile power backed by other types of military strength to compel respect. In his opinion the United States had and would continue to have such strength.

Defense Secretary Thomas S. Gates strongly agreed with the President. He addressed himself directly to General Power's main concern—vulnerability of the Strategic Air Command, on its bases, to Soviet surprise ICBM attack. The Secretary considered the General's figures "unrealistic." He also thought that the term "missile gap" was highly misleading because of its focus on one particular type of weapon among the many in the American arsenal. More pertinent than the issue of defense adequacy, he thought, would be a debate about any possible deterrent gap. Such discussion would take into account the entire spectrum of defense, American and allied, as well. As General Schriever put it, "You can't equate the total deterrent position with the number of missiles."

General Nathan F. Twining, Chairman of the Joint Chiefs of Staff and himself a

WIDE WORLD

The Polaris missile, designed to be fired from submarines beneath the surface of the sea, has the advantage of almost invulnerable launching sites.

U. S. AIR FORCE

A Strategic Air Command crew races to their B-52 during a practice alert.

former Chief of Staff of the Air Force, agreed with his Administration chiefs. Referring to the question of a 3–1 ratio of Soviet numerical advantage in missiles, he told Congress: "I don't like to get into a ratio because cold-blooded figures don't explain the defense situation very well. They do not present an accurate comparison of our over-all military strength versus the Soviet Union." As to General Power's concern over a 150-ICBM surprise attack against SAC bases in the continental United States, General Twining said that such an attack "really has to click 100 per cent right. . . . I don't think that any Soviet planner is going to attack the United States on that big a gamble; of course not." If the enemy had one or two thousand ICBM's, that would be a different matter. "If he could turn them loose in that first salvo, he might do the business; but not, I think, with one hundred and fifty, ever."

As to the relative importance of the missile gap as contrasted with over-all strength, the Administration had a very strong point to make with its Polaris submarine-launched missile program. Previous long-range ballistic missiles, both Soviet and American, must be prepared for firing by having great quantities of fuel and highly inflammable liquid oxygen pumped into them. Such rocket missiles require an immense amount of support equipment, which accounts for from 70 to 80 per cent of the cost of each ICBM or IRBM unit.

With the Polaris, the Navy substituted solid for liquid propellant. Such a missile may be stored indefinitely and safely, all ready to fire, with little in the way of auxiliary gear. Because the Polaris is much smaller than an Atlas or Titan, the Navy at last had a long-range missile that it could practically and safely accommodate aboard ship. Not only that: the Navy found that specially designed submarines could launch it from underwater. On clearing the surface the powder would be ignited and the automatic navigation system would set the rocket on course to its distant target.

The Administration emphasized that it favored the Polaris strongly. Installed in atomic-powered submarines, such missiles would have "bases" that could cruise under the oceans indefinitely and in complete secrecy. In addition, these missiles could aim accurately without ever betraying their position. Such missile submarines would give potential attackers great pause because, as an element of the American deterrent retaliatory force, they would not be subject to prior surprise attack.

Such submarines should, the Administration believed, be reckoned into any missile balance. Each would carry sixteen Polaris missiles ready to fire. The entire missile establishment of each submarine is served by a mere thirty-three men. The first of these submarines was to enter service late last year. With eight more being built at top speed, the Polaris program, as of January 1960, was to add 144 ready-to-fire missiles to American strike-back strength.

There were yet other important features of the defense program intended to offset the development of a deterrent gap. Tested before the debate was the Skybolt missile, to be launched from bombers at supersonic speeds to course some 1,000 miles to its distant target. It would permit bombers to avoid penetrating Soviet air defenses (which were reported improving) in order to loose their bombs. In addition, armed with several missiles of such range, a single bomber could attack several targets in quick succession and from a great distance. Finally, the speed of these missiles would make their chances of getting through to target better than that of the subsonic jet B-52 bombers that carried them.

While awaiting Skybolt, last year the Air Force began arming its latest B-52's with the Hound Dog missile. Also designed to be launched well away from the target, Hound Dog lacks the range and speed of Skybolt, but is far better than normal-type bombs.

Nor was the Administration completely neglecting air alert for the Strategic Air Command. In the official view, its programed $90,000,000 would suffice unless or until the international situation should change greatly.

By mid-February, the Administration appeared to have won its case, in the main. Defense critics generally agreed that the issue was indeed one of a deterrent gap. As to whether there were enough deterrents of all types, the issue boiled down to the question, "How much is enough?"

The position of the critics was well summarized by Senate Democratic Leader Lyndon B. Johnson, who told his colleagues, "If we speed our defenses and they are not needed, all we lose is the money. If we fail to step up our defenses and they are needed, we could lose our country."

There were many prominent business and intellectual leaders who agreed with the Congressional critics that too little was being done, not just in missiles but in all categories. They voiced concern that not enough was being done for the defense of the free world.

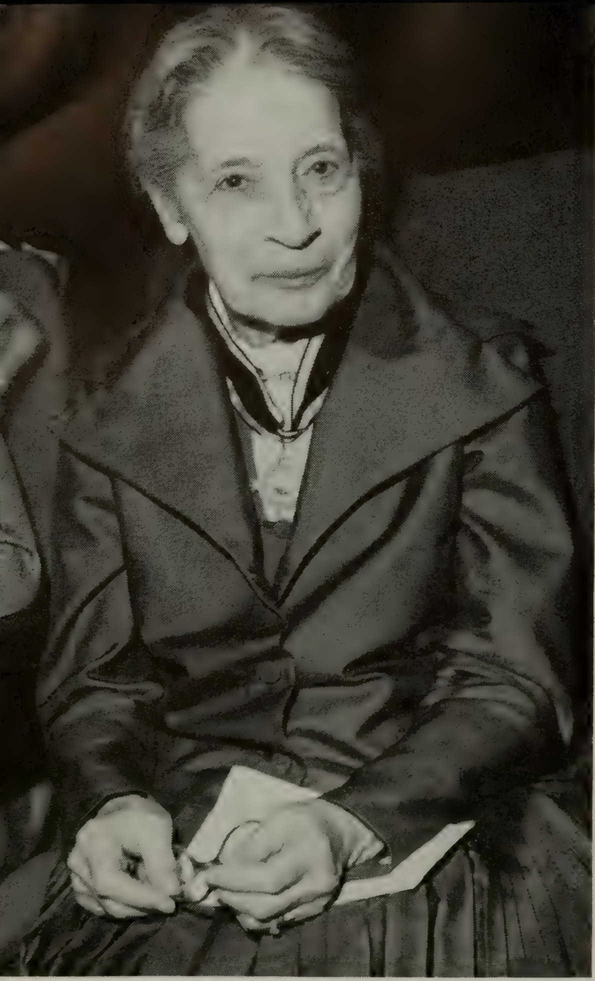
Nevertheless, the Administration had an excellent reason for believing that such concern was no longer justified. Government officials only hinted at this reason while the defense debate was at its height. But it was plain that they had firm and increasing evidence to show that the Soviets were, for the time being at least, trending away from the arms race. The national intelligence estimates, as presented by Central Intelligence Agency Director Dulles, did specify that the Soviet ICBM program, which had gotten off to a faster start than the American program, had not been followed up in 1959 at the same all-out tempo. Intelligence authorities also noted that Soviet missiles were not being fired at a rate to provide crew training for the number of missiles that the Soviets could build.

It was clear that the Soviets either were slackening their arms pace or, like the United States, had decided to await more economical and efficient missiles. Their ICBM's, huge affairs with liquid-fuel rocket motors far more powerful and greedy for fuel and oxygen than Atlases and Titans, obviously presented the Soviets with a worse problem than the United States faced. It seemed clear to some observers that Administration officials feared to talk much about possible Soviet trends toward economic war and disarmament lest they contribute to as yet unjustified hopes.

The defense debate proved that men of the best will in the world will differ on major issues. That is obviously why the best sort of government is one that permits them to thrash out major issues openly, fully and fairly. This was one of the most heartening aspects of the debate on the missile gap that was transformed into one on a possible deterrent gap.

LISE MEITNER

By ELIZABETH VON ESCHTRUTH-WERNER
Free-Lance Writer



ULLSTEIN BILDERDIENST

A great physicist, Dr. Meitner was on the historic team that first succeeded in splitting the atom.

LISE MEITNER, who today ranks among the world's most famous physicists, began her work in scientific research at a time when women were not yet readily accepted in that field. Now in her early eighties, Dr. Meitner is one of the physicists whose experiments contributed significantly to the development of atomic power.

The world was very nearly deprived of the genius of Lise Meitner. In 1902, as a student at the University of Vienna, she was majoring in chemistry and physics in preparation for a career in science. She gave evidence of more brilliance than most of her classmates, but the slight 23-year-old girl was given no encouragement to enter research. Men did not object strongly to women's working in factories, but they strenuously disapproved of their entering the professions. She nearly decided to give up her dream of research and to content herself with teaching.

Fortunately in 1902 Lise Meitner read in a scientific journal a modest report that shattered many of the accepted principles of chemistry and physics. It told of the discovery of the first radioactive elements, radium and polonium, by Marie and Pierre Curie. She read and reread the report with intense interest. Then she read everything else she could find by or about Madame Curie—for here was a woman who had made a place for herself in the man's world of scientific research. Lise Meitner decided that if Marie Curie had succeeded while carrying the double burden of poverty and prejudice, she, too, could make a place for herself in science.

She had not yet decided in what area of science she wanted to specialize. The reports of the Curies' work settled this problem for the young Jewish Austrian student. Now she became more and more fascinated by their discoveries, which opened the door to an entirely new understanding of the physical world. She decided to devote herself to research in the field of radioactivity. Berlin was one of the few places where such research was being done, so it was there she decided to go, after she received her Ph.D. degree in 1906. In the meantime she published several papers in scientific journals—all under her family name without a first name. This was a common strategem used by educated women of the time to get material published.

In Berlin, Dr. Meitner presented herself to Dr. Max Planck, the German physicist noted for his formulation of the famous quantum theory. He was astonished at this young woman who asked to attend his lectures because she "wanted to understand physics more thoroughly."

"You have a doctor's degree. What more do you want?" he asked.

However, five years later this talented young woman had won Dr. Planck's confidence. He named her an assistant lecturer at his Institute of Theoretical Physics at the University of Berlin. This was an unheard-of thing in Germany at that time, but Dr. Planck's boldness in placing a woman on his staff proved the open-sesame to an illustrious scientific career for Dr. Meitner. She worked under Dr. Emil Fischer, who has been called the "master of organic chemistry," and assisted the noted German chemist and physicist Dr. Otto Hahn. Laboratories were closed to women, so the young assistant conducted her research in the carpenter's shop.

By 1917 her reputation had grown to such an extent that Dr. Meitner was named head of the Physical Radioactivity Department at the Kaiser Wilhelm Institute. It was here that she became interested in the artificial transmutation of elements and that she did some of her most creative work. In 1918 she and Dr. Otto Hahn discovered protactinium, a new radioactive element. Here, too, she became distinguished for work on the disintegration products of radium, thorium and actinium, the behavior of beta rays and the physics of the atomic nucleus. Later, with Dr. Hahn, she devised an atomic microscope to observe chemical action.

In 1938 she, Dr. Hahn and Dr. Fritz Strassmann bombarded the uranium nucleus with slow-speed neutrons. They found they had by this means caused uranium to turn into other elements. The three scientists knew that they were on the verge of an exciting new discovery, but they were interrupted in their work. Hitler's anti-Semitic policies made it impossible for Dr. Meitner to stay in Germany.

Dutch scientists helped her escape through Holland and Denmark to neutral Sweden where she immediately set to work again. On the basis of an atomic model constructed by Danish Dr. Niels Bohr, Nobel Prize winner in physics, Dr. Meitner mathematically solved the mystery of the elements coming from the uranium nucleus. Her report was published, announcing that, under bombardment, uranium had turned into two other elements, barium and krypton. This was the first time an atom had been split. Dr. Meitner calculated that the energy released in this fission process amounted to 200,000,000 electron volts per atom! This work gained her membership in the Nobel Institute in Stockholm—a rare honor for a woman and a foreigner.

In the United States in 1939 Dr. Bohr reported on the Meitner-Hahn-Strassmann work—the work on which the development of the atomic bomb was based.

It is fitting that the United States, which has played a leading role in providing broad professional opportunities for women, joined other nations in honoring this great scientist. She has been awarded honorary degrees from the University of Rochester, Rutgers University and Adelphi and Smith colleges. A member of honorary scientific groups in Sweden, Denmark, Austria and even in Germany, she holds numerous medals and awards for her work.

Today one of Dr. Meitner's greatest satisfactions is in seeing the constructive applications of atomic energy. Another is that during her lifetime she has seen nearly all the professions opened to women.

In 1959 Dr. Meitner told Bryn Mawr College students: "We can no longer doubt the value and indeed the necessity of woman's intellectual education, for herself, for the family and for mankind."

Science Highlights in 1960

By WATSON DAVIS

Director, Science Service

Editor's note: *It has been impossible, because of lack of space, to include in this brief review of the high spots of science all the most important happenings of the year 1960. Some of the items that have had to be omitted from this review are dealt with in other articles in this section or elsewhere throughout the book. The items that are listed have been carefully chosen by Mr. Davis and other members of the Science Service Staff.*

AERONAUTICS

A giant Skyhook balloon, 400 feet high when inflated, was launched from the airplane carrier Valley Forge and carried 750 pounds of emulsion plates to an altitude of 115,000 feet; the plates, with tracks of high-altitude cosmic rays, were successfully recovered.

The experimental plane X-15 was flown at 1,700 miles per hour at an altitude of 136,500 feet and on another occasion at 2,150 miles per hour at an altitude of 66,000 feet.

Captain Joseph Kittinger, Jr., reached an altitude of 102,800 feet in an open gondola balloon and parachuted to earth from 19½ miles up, reaching 614 miles per hour during free fall.

A height-surveying radar to show the altitude of planes approaching a landing field was installed experimentally.

A system involving the use of red and white lights to guide a private pilot in on the correct path for a safe touchdown was tested; if the pilot is too high he sees only the white lights, if too low he sees only the red ones.

A new low-cost continuous-flow hypersonic wind tunnel made possible speeds of Mach 15 and higher and a temperature of 2,000° Fahrenheit for testing airplane models.

An unmanned plane that can make surveys of enemy territory and relay photographic, radar and infrared data day or night under all weather conditions was made public by the Army.

Microphones as tiny as a letter of the type used in most newspaper want ads were built to study the great roars of jet aircraft and rockets.

The "ultimate airplane" was foreseen by an aircraft engineer as being 170 feet long with a wing span of nearly 99 feet and capable of a speed of 17,000 miles an hour, almost 25 times the speed of sound.

An Army research airplane was demonstrated that replaces conventional engine-driven propellers with wing-tip fans enclosed in shells like a sawed-off, open-ended barrel that can be tilted at any angle between straight up and straight ahead for vertical or forward flight.

ANTHROPOLOGY AND ARCHAEOLOGY

Discovery of three new Neanderthal skeletons at depths of 14 to 27 feet under a cave floor in Iraq, and comparison with each other and with three others found in 1957 at the same levels, promise to provide new knowledge of the evolution of this forerunner of man.

Alacaluf Indians living off the tip of the mainland of South America were found to have higher resting metabolism and body temperatures than white persons and to better withstand low environmental temperatures.

The children of broad-chested parents were found to grow faster and mature earlier than children of narrow-chested parents.

That man lived in South America as much as 10,000 years ago was indicated by the find of stone tools and other man-made objects estimated to be that old.

Many governments and public and private institutions joined in a campaign of UNESCO to save ancient archaeological treasures of Egypt from the menacing waters backing up behind the Aswan dams.

A new method was developed for determining the age of ancient obsidian objects by measuring the thickness of the surface layer in which moisture had been absorbed.

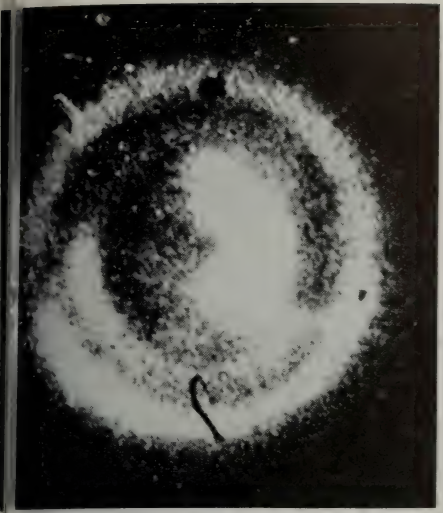
Remains were found of a big ancient city that extended for more than eight miles along the Porali River in Western Pakistan and in which the only buildings were temples and other places of worship.

Remains of an early Phoenician colony were found buried under the ruins of a monumental Roman city at Leptis Magna on the northern coast of Africa.

Valuable archaeological sites in the path of freeway-building operations were saved by a cooperative program between the University of California at Los Angeles, the California Division of Highways and the Division of Beaches and Parks.

A cargo of bronze implements and oxhide-shaped copper ingots were salvaged from a ship sunk in 1450 B.C. on its way from Cyprus to Turkey.

A marble statue with feet missing which has



The first X-ray photograph of the sun. The picture, which shows the sun ringed by a bright X-ray halo, was taken from a special camera in an Aerobee-Hi rocket launched from the White Sands Missile Range.

ALL PHOTOS, UNLESS OTHERWISE INDICATED, SCIENCE SERVICE

Captain Joseph Kittinger, Jr., models the spacesuit that protected him during his balloon ascent to 102,800 feet and parachute jump of 19½ miles.

been on display for years in the United States unidentified was identified as a copy of the Victory statue that once stood poised on the hand of the giant statue of the goddess Athena in the Greek Parthenon.

A series of pre-Hispanic paintings numbering several hundred were discovered in a pueblo excavation near Los Lunas, New Mexico.

ASTRONOMY

The most distant identifiable celestial object, believed to be a galaxy or a pair of galaxies in collision six billion light-years away, was photographed with the 200-inch Hale telescope.

New studies of Cepheid variable stars, used as distance indicators, were reported to give corrections for changes in color due to age or intervening dust clouds, thus allowing more accurate distance determination.

A new method for finding the ages and distances of stars, which depends on precise measurements of a star's radiation within certain narrow, especially selected regions of the rainbow-hued spectrum of light, was reported.

A radar signal was sent to the sun's outer corona and back in 17 minutes, marking man's first direct contact with the sun.

The first X-ray photograph of the sun, showing it ringed by a bright X-ray halo, was taken from an Aerobee-Hi rocket carrying a specially designed camera more than 130 miles above the earth's surface.

The absolute positions of eight strong sources of radio waves broadcasting in the heavens were established, and accurate positions of a dozen discrete radio sources were determined.

The brightness of newly formed stars differs from one region of the universe to another, an astronomer reported, contrary to the accepted assumption of uniformity.

The first clear photograph of the white gaseous dots contained in sunspots was made by Stratoscope I, a 12-inch balloon-borne telescope flown high above the earth's surface.

Radio waves from Saturn, detected for the first time, showed the planet's atmospheric temperature is 283° below zero Fahrenheit.

The high amount of lithium on earth compared to the amount in the sun was reported as supporting the theory that the earth and other planets were formed by condensation of material once a part of the sun.

United States plans for observing the moon, planets, sun and the entire universe from an earth-circling satellite carrying a telescope were announced.

It was estimated that one grain of a neutron

Temple of Isis on Philae will be in further danger from the Nile when the Aswan High Dam is built.

star, believed to be the leftover core of an exploded supernova, weighs more than 100,000,000,000 grams a cubic centimeter.

The Kitt Peak National Observatory was dedicated and first observations made with the 36-inch telescope; the glass for the 84-inch is being ground.

The planet Jupiter is sending out radio waves showing that the explosion causing them is the earthly equal of a 100-megaton hydrogen bomb exploded every second, it was reported.

Oxides of nitrogen poison the atmosphere of Mars, making any kind of life there unlikely, it was reported.

Nitrogen tetroxide was discovered in the atmosphere of Venus, and the water vapor below the cloud level there was found more abundant than was previously thought.

Mars and Venus were reported to have substantial radiation belts, as the earth does, and the dust particles of interplanetary space were observed in the atmospheres of the two planets; the Martian satellite Phobos was suggested as an ideal platform for observing the planet.

Large radio telescopes in advanced construction stages included a 1,000-foot one in Puerto Rico, a 600-foot one in Illinois and a 142-foot one in Scotland.

The probable existence of many undiscovered stars near the sun, belonging to the Hyades and Sirius stellar groups, was reported.

BIOLOGICAL SCIENCES

Scientists crossed a Cornish chicken and a turkey to produce a "churk," the first true hybrid between two families of birds.

Chlorophyll was synthesized by two independent research groups, one in the United States and the other in Germany.

The 330,000,000-year-old stone remains of a fossilized liverwort, one of the world's most common plants, indicated that life on earth may have existed longer than previously thought.

Ninety dead seals entombed for 2,600 years in the ice of Taylor Ravine in the Antarctic were detected by aerial-survey photograph and two perfectly preserved specimens were brought to the United States for study.

A revolutionary genetic discovery was made when it was found that the cortex, or outer jacket of the one-celled animal paramecium, influences the looks of offspring, thus indicating that inherited characteristics are controlled not only by the genes and the contents of a cell's nucleus and cytoplasm but also by the structural organization of the cell itself.

Hereditary mutations were identified as tiny loops in molecules of DNA, deoxyribonucleic acid.

Zoologists are setting up a resident research station on the Galapagos Islands to halt exploitation and prevent extinction of the famous native tortoise that gave Charles Darwin a major insight for *The Origin of Species.*

The churk, the result of a cross between a chicken and a turkey. It was the first known case of two families of birds being hybridized successfully.

The first known living fluorescent corals were found at depths below 100 feet on South Pacific reefs off the coast of New Caledonia.

Studies show that houseflies have an adaptable enzyme system that changes from one generation to another and aids these pests in developing resistance to insecticides.

A prairie-dwelling grasshopper, *Paratylotropidia brunneri Scudder,* was found to communicate over fairly long distances by producing an audible sound with the mouth, the first insect known to have this ability.

Investigators found that Savannah sparrows have a type of built-in, salt-to-fresh-water converter that allows them to ingest sea water containing nearly 2 per cent of body weight of salt per day with no apparent harm.

Russian scientists discovered that the earth's magnetic field exerts a definite effect on growth processes in plants, growth being greatest when roots are oriented toward the South Magnetic Pole.

A Federal humane-slaughter law became effective August 30, 1960; it requires packers selling meat to the Government to immobilize animals before slaughter by using carbon dioxide, electric shock or mechanical concussion.

CHEMISTRY AND PHYSICS

Light pulses were generated by an optical maser, opening a new method of communication, particularly in space; other important applications of masers, which amplify light beams, include projecting television pictures, photographing astronomical objects, and in medical diagnosis by X rays or fluoroscopy.

France became the fourth nation to have nuclear weapons and fired an atomic device in the

Sahara Desert in February.

The neutral pi meson was found to have a lifetime of a quarter of a millionth of a billionth of a second, the shortest lifetime of an elementary particle.

A new class of highly active antihistamine drugs, derived from isoindoline, was found.

Sound waves can be used to measure accurately the rates of fast chemical reactions, it was found.

The largest and most powerful cosmic-ray shower ever observed was recorded, confirming evidence that some cosmic rays come from outside the Milky Way galaxy.

Brookhaven National Laboratory brought into operation the 33 Bev alternating-gradient synchrotron accelerator, to establish a new world's record for speeding up particles.

The radioactive debris from explosions of nuclear weapons was recognized as an important tool for studying the mechanisms and rates of natural processes involving carbon.

A new generator, operating on partly carbonized lignite, produced a gas, similar to "water gas," that was used as a source of chemicals as well as a substitute for natural gas, a significant step toward the commercial utilization of American lignite.

The melting point of technetium was measured for the first time and found to be close to 4,000° Fahrenheit.

A new theory was proposed extending the theory of relativity to account for the structure of elementary particles such as electrons and protons by requiring the assumption that such particles undergo changes in dimensions when moving in an electromagnetic field.

Tests showed that water from a well contaminated with radioactive materials can be purified with standard United States Army water purification equipment.

A new standard for the meter, 1,650,763.73 times the wave length of the orange-red spectral line of krypton 86, was adopted.

A material, polybutadiene, that has the characteristics of both plastics and rubber was developed.

Plans were announced to install and operate a portable nuclear reactor on the Greenland ice cap.

A new synthetic rubber that is completely nonflammable, highly resistant to attack by gasoline and corrosives and still soft and resilient at 60° below zero was developed as one nitrosofluorocarbon rubber.

The high atmosphere concentration of radioactive strontium 90 was found to be much lower in 1960 compared to 1959, less than 15 per cent of the total world-wide fall-out from nuclear explosions remaining in the upper atmosphere.

More than five pounds of the man-made element plutonium were placed in a reactor for long-term bombardment by neutrons, to produce the largest quantity of the element californium and pave the way for the preparation of element 103 and other heavier elements.

The explosion of hydrogen bombs in the atmosphere interferes with radio reception because the highly ionized region formed by the explosion lasts for several days and greatly increases the atmospheric absorption of radio waves, it was reported.

The first computer-made journal was produced.

A time-of-flight mass spectrometer able to analyze chemical reactions that occur in 1/10,000th of a second was developed.

ENGINEERING AND TECHNOLOGY

A short-wave radio transmitter was developed that can simultaneously broadcast two or more independent transmissions on different wave lengths.

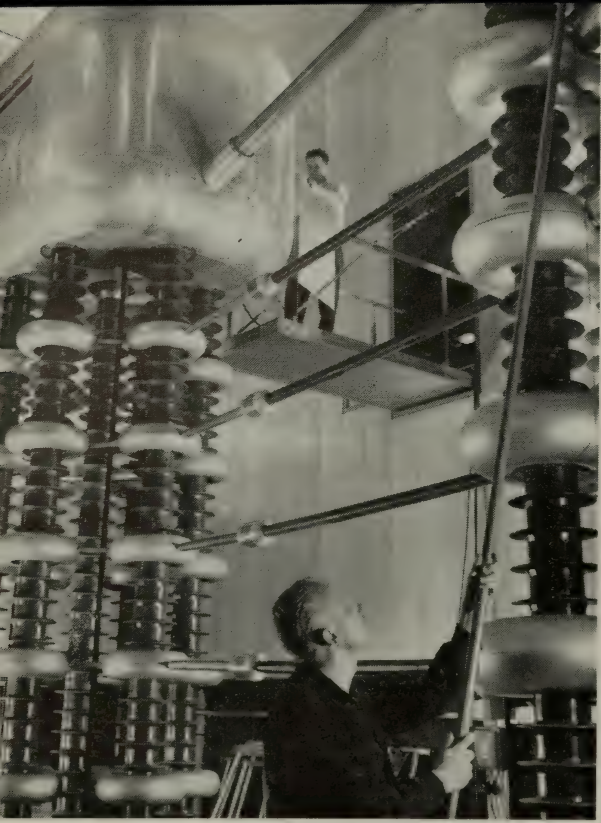
A two-way message system used radio signals reflected from the ionized air left in the wake of meteors.

A machine that can "understand" ten spoken syllables was built as a step toward production of a typewriter that will type spoken words and factory machines that will work in response to spoken directions.

A method was developed for producing instant food powders by whipping liquid food concentrates into a foam, spreading the foam on a belt or tray, drying it and compressing and crushing it into powder form.

The world's largest permanent magnet,

The optical maser, which generates light pulses It can be used for communication with satellites, In TV, astronomical photography, medical diagnosis



BROOKHAVEN NATIONAL LABORATORY

The Cockcroft-Walton generator provides the initial acceleration of 750,000 electron volts to protons destined to enter the 33 Bev alternating-gradient synchrotron accelerator operated by Brookhaven.

weighing 1,720 pounds and measuring 52½ by 36 by 10 inches, was built to help pump liquid sodium in a breeder-type nuclear reactor.

A portable fuel-cell power plant was developed for mass production for the armed services; it has no moving parts, never needs recharging, but produces electricity to power radar systems directly from its fuel, a metal hydride.

An experimental gas-turbine-powered hydrofoil ship was developed and skimmed inland waters at up to 50 miles an hour.

To prepare books for the blind, a new method was developed reproducing Braille letters by baking plastic dots onto paper, instead of embossing them in the paper itself; the results are similar to Louis Braille's original method, roundheaded nails driven into a plank.

The work of nuclear physicists and meteorologists will be made easier by development of a more advanced solid-state digital computer, the LARC, capable of 250,000 additions or 125,000 multiplications per second, performing as much work in one hour as 40 men working with desk calculators could accomplish in 100 years.

A transatlantic telephone cable system went into service that will carry the voices of 36 persons at once over a wire only 13/100ths of an inch thick.

An experimental electric tractor powered by 1,008 fuel cells pulled a multiple-bottom plow through parched, packed earth, pointing to the start of a revolution in powered farm machinery.

A clinical electronic thermometer that operates on transistors and a small battery was developed and enabled a hospital nurse, by flicking a switch, to read a patient's temperature from her office.

New alloys of columbium were developed that meet space-age and nuclear requirements.

A revolutionary, low-distortion radar system was developed that can observe enemy troops in almost any kind of weather and can produce aerial maps of thousands of square miles of land per hour, night or day, working from either piloted or unmanned aircraft at ground speeds of 200 to 900 miles an hour.

GEOPHYSICS

A national center of atmospheric research was established by the National Science Foundation to conduct and stimulate basic research on weather.

Geophysical studies indicated that the mantle of earth is as rigid as steel during short periods of time but can be permanently deformed, like a plastic, by forces affecting it over a multimillion-year span.

Although lack of funds continued to plague the Mohole project to dig through the earth's crust, the program entered a new phase with the selection of a ten-mile-square area off Guadalupe Island as a possible site for drilling experiments.

Hurricane Donna caused damage estimated at more than a billion dollars and loss of more than a hundred lives.

A new way of detecting tornadoes and earthquakes by recording the low-frequency sound waves generated by them was developed.

A mile-long rock slide containing from 35,000,000 to 50,000,000 cubic yards of rock occurred in southern Montana, killing about 20 people and damming the Madison River; it was the result of an earthquake of 7.1 to 7.8 magnitude.

A study of the orbits of American satellites showed that the earth's atmosphere flattens at the North and South poles.

By comparing three series of weather records, the United States Weather Bureau concluded that large amounts of rain seem to fall on certain dates year after year.

Studies of seasonal and annual temperature means confirmed that the climate of the continental United States has grown warmer since the beginning of the twentieth century.

Underwater sound waves from depth charges were detected at a record distance of 12,000 miles, or virtually halfway around the world.

The earth's magnetic field at ground level was found to be affected, with a lag of less than one minute, by changes in electric currents far above the earth where high-speed charged particles, such as those in the Van Allen radiation belts, are trapped.

The Van Allen belts that surround the earth in space can damage the solar batteries used to power satellite instruments by changing the vital structure of their semiconductors and blackening the quartz windows designed to let in the sun's light.

It was established that the blue haze seen over areas of vegetation on a warm summer day is actually petroleum in the process of formation.

A 15,980-foot-tall undersea mountain, higher than California's Mt. Whitney, was discovered about 550 miles west of the Cape of Good Hope, South Africa.

Geologists concluded that Sierra Madera in western Texas is the site where an asteroid from outer space exploded as it struck the earth.

A study of the decay of radioactive potassium to argon enabled a geologist to set the age of the Palisades that line 20 miles of the western shore of the Hudson River in New York and New Jersey at about 190,000,000 years.

MEDICAL SCIENCES

The United States Public Health Service approved the Sabin oral live polio-virus vaccine for manufacture by potential producers.

A new penicillin called Staphcillin proved active against all strains of staphylococci tested and was tolerated by some individuals who are allergic to other penicillins.

A technique for detecting mouth cancer was found effective by dentists after a three-year trial of taking smears or scrapings from the mouth for microscopic examination.

Lung cancer was linked to arsenic in both coal smoke and cigarette smoke.

Paralyzed leg muscles were made to function again by an experimental electrical device that shocks the muscles and makes them draw up.

THE NATIONAL FOUNDATION

A high-school student takes the Sabin oral live polio-virus vaccine approved for manufacture by the United States Public Health Service.

A body hormone, aldosterone, produced by the adrenal glands, was found to be 250 times as powerful a heart stimulant as the most effective drugs known.

High blood pressure caused by poor kidney supply was corrected by surgery linking the main aorta and the kidney with synthetic blood vessels.

A portable "laughing gas" generator was developed for use by medical units under combat conditions.

Completely reshuffled cells, taken from the liver or kidney of chick embryos, reconstructed the same organ without outside direction.

A living stomach was filmed in color for the first time through a technique of using glass fibers to transmit the light necessary for motion pictures made with highly sensitive film.

Clots in the blood vessels of animals' lungs were located by X ray and removed by surgery.

A human kidney was refrigerated and preserved during surgery with a new device operating on the principle of air-to-liquid heat exchange.

Skin storage for burn grafting was demonstrated in Germany to be safe for as long as five years by using fixed cold-temperature procedures.

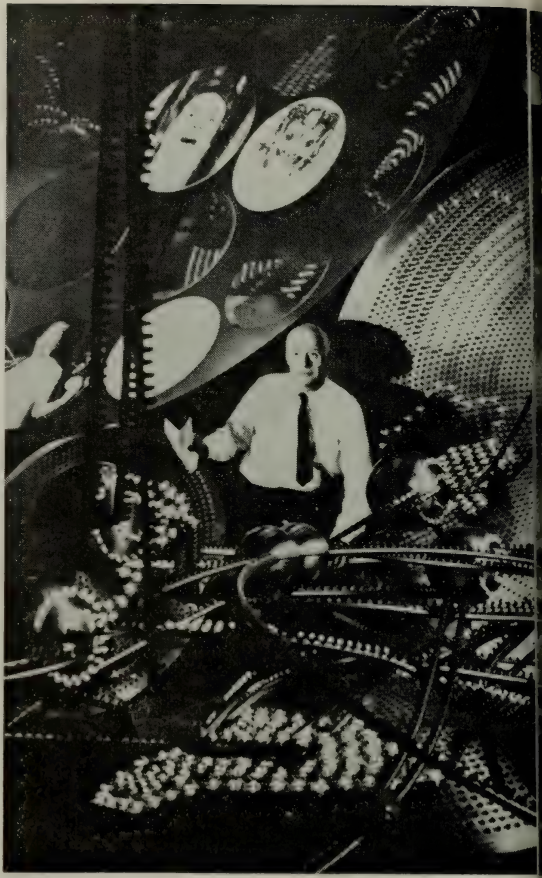
The pain of burns was lessened and healing speeded by immediate treatment with ice water, continued from thirty minutes to five hours.

Men need more food when they live in extreme heat than when they live in moderate temperatures, an experiment showed, upsetting previous theory.

An unknown factor in peanuts was reported to control bleeding in persons suffering from hemophilia.

A seaweed compound called alginon when mixed with water was successfully substituted

The soldier's "pack" is a fuel-cell power plant. It produces 200 watts of direct current at 24 volts as its fuel, a metal hydride, decomposes in the air.



The complicated array of lights, wheels and tubes is a model of the human brain that shows how sensory messages such as light and sound enter into the process of thinking. In the photograph a singer's voice is the stimulus.

for whole blood in transfusions.

Aspirin was shown to be as effective in treating rheumatic fever as ACTH and cortisone.

PATENTS

Numbers following items are United States patent numbers.

A food-irradiating process aimed at lengthening storage life of foods through use of refrigeration and prolonged exposure to low-intensity radiation. Patent 2,920,969.

A method of making colored motion-picture film from a black-and-white original. Patent 2,927,857.

A ballast-parachute system that increases the operating life of research balloons by keeping them from falling below useful altitudes and by speeding their ascent to such altitudes. Patent 2,931,597.

An atom-bomb simulator complete with mushroom cloud and fake fall-out drops, designed for troop training. Patent 2,934,013.

A mechanical sniffer to detect smoke and turn on fire extinguishers in the various cargo holds of a ship. Patent 2,935,135.

An explosive chemical method of cleaning out mined areas in ground warfare. Patent 2,925,038.

Child-proof kitchen-stove controls that remain locked in off position until the upper part of an adult's body intercepts a light beam. Patent 2,926,656.

A jet engine with reversible thrust, designed to allow jet aircraft to land in a smaller space. Patent 2,944,394.

An underwater camera housing that may be adapted to fit almost any 35mm. camera. Patent 2,944,474.

Tobaccoless cigarettes made of specially treated, nonacrid corn silk and alfalfa. Patent 2,943,958.

A submarine noise-damping system designed to gather noise and channel it to the ship's stern where it is smothered in glass-fiber batting. Patent 2,942,681.

A safe, radioactive battery in which the energy of charged particles emitted by a radioactive isotope is converted into heat energy and then into electricity. Patent 2,913,510.

A floatable breakwater barrier for calming rough waters during ship loading and oil drilling. Patent 2,928,250.

A commercially feasible method of purifying dirty crankcase oil for re-use. Patent 2,922,758.

A nail containing sealed-in termite poison that is not released until the nail is driven well into the wood. Patent 2,923,039.

A four-chambered filter that attaches to an automobile exhaust pipe and uses castor oil to reduce noxious fumes. Patent 2,932,157.

A decoy torpedo equipped with electric motor, phonograph and amplifier, and a loudspeaker designed to simulate the noises of a submarine and lure away attacking ships while the real submarine escapes. Patent 2,938,483.

A card of papers chemically treated to change color in the sun, for warning sun bathers of impending burn. Patent 2,949,880.

PSYCHIATRY AND PSYCHOLOGY

One monkey is able to communicate useful information to another monkey, and thus enable the partner to earn a reward for both, it was found experimentally.

Use of the drug LSD-25 (lysergic acid diethylamide) made it possible to "reach" mental patients otherwise unresponsive to psychotherapy, 88 out of 110 showing "slight" to "outstanding" improvement.

A built-in "sonar" was found to enable a porpoise to go to, catch and eat available fishes and never try to reach other fishes behind a glass barrier; the animal emits trains of sound pulses later picked up by him after reflection from fishes or other objects in the water.

A teaching machine consisting of a specially programed tape recording made it possible in 20 days to teach a 450-word miniature of the Russian language to soldiers, even those whose lack of aptitude would make it impossible for them to learn Russian by conventional methods.

It was found experimentally that most otherwise unexplained "flying saucers" are probably "afterimages," a well-known peculiarity of perception.

Human intelligence consists of many facets or abilities, many as yet unidentified, which may eventually be found to number 120 or more, it was reported.

Chemists make their most important as well as their greatest number of discoveries when young—28 per cent of the most important discoveries between the ages of 25 and 35.

Individuals work together better in a small group if they have quite different personalities.

Too much "peace and quiet" were found to be the worst possible treatment for elderly persons because sounds serve as a bridge to reality.

Statistics reported in 1960 showed that the number of resident patients in the nation's public mental hospitals dropped during 1959 for the fourth consecutive year.

The aging person who retires suddenly is like the deep-sea diver who surfaces too rapidly; he suffers from a kind of psychological "bends" due to reducing the pressure too fast, it was reported.

One-second bursts of loud noise, such as come from the firing of rockets, were found to cause a temporary decrease in the efficiency of men making rapid simple decisions.

An inborn need of human infants for companionship was found to be more important for survival than the need for food and warmth.

SPACE

A communications satellite, Courier, which received and sent news at the speed of 68,000 words per minute over 20 teletype channels, was placed in orbit.

Rockets sent to the moon should be biologically clean because microbes carried to the moon would destroy sources of information on the origin of life and the history of the solar system, it was urged.

The balloon satellite Echo I developed wrinkles in its thin shell but was still performing after several months in orbit.

Highly permeable magnetic metals could be used as rudders on spaceships to control the direction of flight by interaction with the earth's magnetic field, studies of Vanguard II's orbital rotation showed.

Solar radiation pressure was found to account for the discrepancies between calculated and observed heights of Vanguard I.

The Ballute, a pop-up, or drag, balloon to slow down space vehicles as they re-enter the atmosphere.

An airplane-launched ballistic missile made a short trip alongside the paddle-wheel satellite Explorer VI.

An experimental ion engine capable of developing speeds of 100,000 miles an hour was under construction.

The Polaris system, submarine-launched missiles with a range of 1,500 miles, became operational in 1960 at a cost of $2,742,648,000 appropriated since the system was proposed in 1954.

A milk-bottle-sized rocket designed to maneuver satellites about in space proved successful in simulated space tests.

A nylon-net spacesuit, designed to hang suspended like a hammock in seatless cockpits of future spaceships, was developed to keep astronauts from floating about on gravity-free flights.

Year-long series of tests on rocket-engine cases made of aluminum showed that aluminum is stronger than the same weight of steel.

It was calculated that only about 15 pounds of helium gas would be required to form a blanket about a spaceship to protect it from overheating on a 4,000-mile flight at an altitude of 20 to 30 miles.

Pyrographite, a high-purity form of graphite able to withstand temperatures up to 6,700° Fahrenheit, higher than any other known element, was developed as a possible solution to some of the problems in missile construction.

Gold film, four millionths of an inch thick, was found unequaled as a reflector of heat radiation when used on missile and aircraft sections.

Messages could, in an emergency, be relayed by rocket 300 miles up as far as 1,400 miles along the earth's curvature, a rocket study showed.

Daphnia, or "water flea," a soft-shelled crustacean, could be used as food for man in space, it was found.

Pop-up balloons were developed to stabilize and slow down nose cones and manned capsules as they re-enter the upper atmosphere.

Accurate space navigation was foreseen through use of the cryogenic gyroscope that operates near absolute zero.

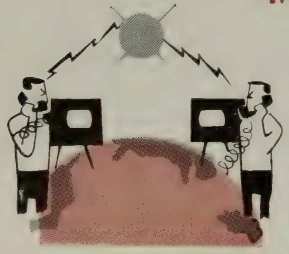
INITIAL UNITED STATES AND SOVIET

KEY ▶ 1. DATE OF LAUNCHING 2. LIFETIME 3. PAYLOAD WEIGHT (LBS.)

SOVIET UNION

	SPUTNIK I	SPUTNIK II	SPUTNIK III	LUNIK I	LUNIK II	LUNIK III	SPACECRAFT I	SPACECRAFT II
1.	10/4/57	11/3/57	5/15/58	1/2/59	9/12/59	10/4/59	5/15/60	8/19/60
2.	3 months	5½ months	23 months	indefinite	35 hours	6 months	3 yrs.	1 day
3.	8,000	8,000	7,000	3,245	858	4,037	10,008	10,120
4.	24	8	1 yr., 326 days	Unknown	35 hours	Unknown	Unknown	1 day
5.	Ⓔ	Ⓔ	Ⓔ	●	Ⓜ (Moon Impact)	Ⓔ	Ⓔ	Ⓔ

MAJOR USES OF SATELLITES



1. IMPROVED COMMUNICATIONS: GLOBAL TV, TELEPHONE, ETC.

2. MORE RELIABLE INFORMATION FOR WEATHER FORECASTING AND NAVIGATION.

3. DEVELOPMENT OF STRONGER METALS, MORE POWERFUL FUELS, OTHER RESEARCH BY-PRODUCTS.

4. INCREASED KNOWLEDGE OF SOLAR SYSTEM AND STARS FROM OBSERVATION UNCLOUDED BY EARTH'S ATMOSPHERE.

5. PROGRESS TOWARD SOLVING RIDDLE OF HOW SOLAR SYSTEM BEGAN AND WORKS.

6. BIO-MEDICAL EXPERIMENTS TO DETERMINE EFFECT OF SOLAR RADIATION ON HUMAN TISSUE.

SPACE EFFORTS Through October 6, 1960 *

4. NUMBER OF DAYS SENDING BACK INFORMATION
5. ORBITING AROUND Ⓔ EARTH Ⓜ MOON ● SUN

UNITED STATES

	EXPLORER I	VANGUARD I	EXPLORER III	EXPLORER IV	PROJECT SCORE	VANGUARD II	DISCOVERER I	PIONEER IV	DISCOVERER II	EXPLORER VI
	1/31/58	3/17/58	3/26/58	7/26/58	12/18/58	2/17/59	2/28/59	3/3/59	4/13/59	8/7/59
2.	3 to 5 yrs. (est.)	200-1000 yrs. (est.)	3 months	15 months	1 month, 3 days	10 yrs. or more (est.)	5 days	Eternal orbit around Sun	13 days	1 yr. or more (est.)
3.	30.8	3.25	31	38.4	8,750	20.5	1,300	13.4	1610	142
4.	113	indefinitely	71	72	12	27	—	(90 hrs.) 4	7	30
5.	Ⓔ	Ⓔ	Ⓔ	Ⓔ	Ⓔ	Ⓔ	Ⓔ	●	Ⓔ	Ⓔ

	DISCOVERER V	DISCOVERER VI	VANGUARD III	EXPLORER VII	DISCOVERER VII	DISCOVERER VIII	PIONEER V	TIROS I	TRANSIT I-B
1.	8/13/59	8/19/59	9/18/59	10/13/59	11/7/59	11/20/59	3/11/60	4/1/60	4/13/60
2.	1½ months capsule still in orbit	2 months	30-40 yrs. (est.)	20-30 yrs. (est.)	19 days	3½ months	100,000 yrs. (est.)	50-100 yrs. (est.)	16 months (est.)
3.	1700	1700	100	91.5	1700	1700	94.8	270	265
4.	—	—	85	1 yr.	—	—	106	78	90 days
5.	Ⓔ	Ⓔ	Ⓔ	Ⓔ	Ⓔ	Ⓔ	●	Ⓔ	Ⓔ

	DISCOVERER XI	MIDAS II	TRANSIT II-A	NRL SATELLITE	DISCOVERER XIII	ECHO I	DISCOVERER XIV	DISCOVERER XV	COURIER I-B
1.	4/15/60	5/24/60	6/22/60	6/22/60	8/10/60	8/12/60	8/18/60	9/13/60	10/4/60
2.	11 days	40 months (est.)	50 yrs. (est.)	50 yrs. (est.)	1 day	indefinite	1 day	2 days	1 year
3.	1700	5,000	223	42	1700	240	1700	1700	500
4.	—	—	1 yr.	1 yr.	—	indefinite	—	—	13
5.	Ⓔ	Ⓔ	Ⓔ	Ⓔ	Ⓔ	Ⓔ	Ⓔ	Ⓔ	Ⓔ

Note: At time of publication, transmitter lifetimes for Discoverer satellites and Midas II were not available.

---

*NASA Release No. 60-270, October 6, 1960

BUILDING BLOCKS OF NATURE

Since the turn of the century, scientists have known that matter is composed of tiny particles, particles smaller even than the atom. Two of the most important characteristics of subatomic particles are mass and charge. Mass is that property that gives matter weight. A particle's electrical charge can be determined from its reaction to a magnet: if the particle moves toward the positive pole of the magnet, it is said to be negative, since opposite charges attract. Similarly, a positive particle moves toward the negative pole. Those particles that do not react to a magnet are said to have no charge.

It is believed that there is an antiparticle for every particle of ordinary matter. The antiparticles probably form antimatter, although not on earth. The ordinary matter of our universe and antimatter would destroy one another if they came into contact. Charged antiparticles have the opposite sign from charged particles; thus, the proton is positive and the antiproton is negative. Some uncharged antiparticles and particles are indistinguishable. In the following table antiparticles have been omitted.

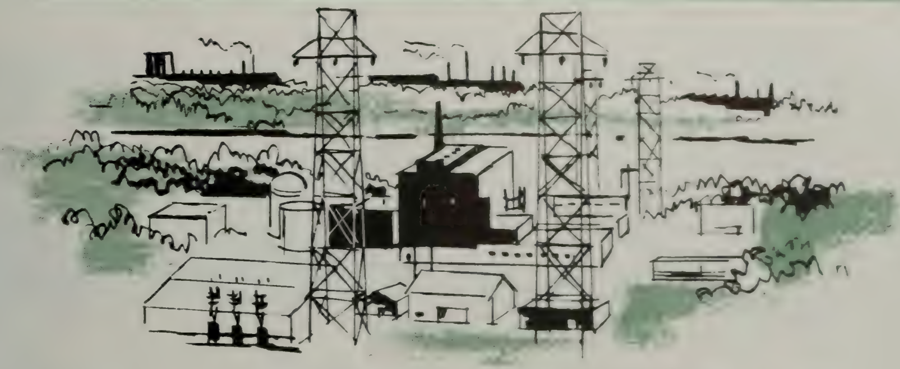
Many particles were predicted long before they were discovered. At present there are no new particles of ordinary matter predicted, although two predicted antiparticles have not been found.

About two thirds of the subatomic particles now known were discovered in cosmic-ray research. Cosmic rays are streams of high-speed protons and atomic nuclei that ceaselessly bombard the upper atmosphere. Because of their great speed, they knock other particles from the nuclei of the atoms in the atmosphere. These particles—"secondary" cosmic rays—are the ones that reach the earth. They are composed of mesons and hyperons which are named with letters of the Greek alphabet. Both mesons and hyperons quickly decay into smaller particles.

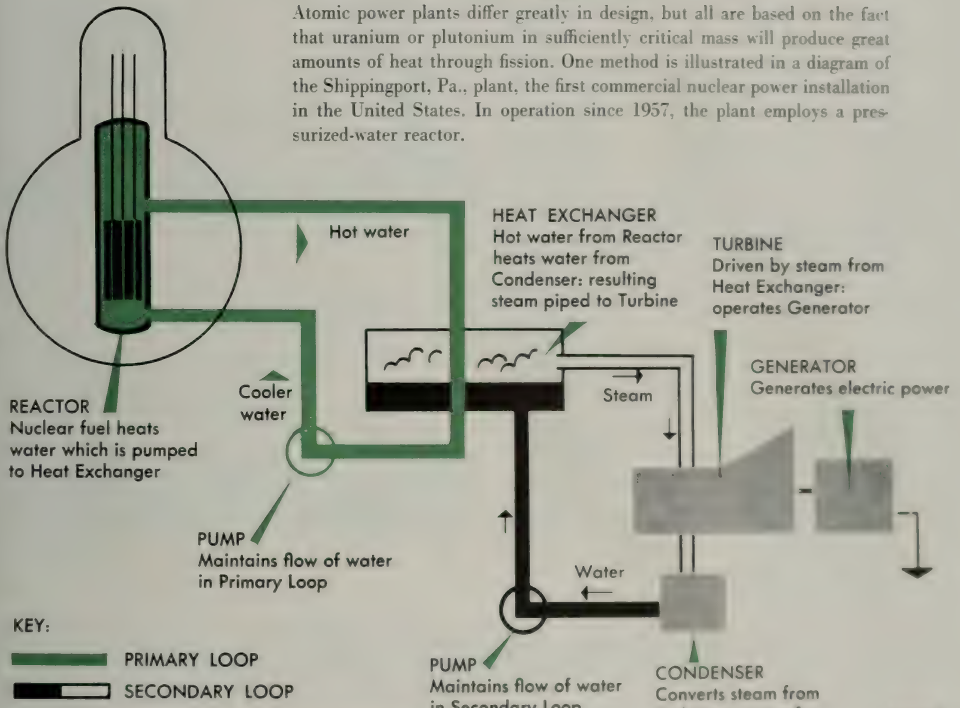
THE ELEMENTARY PARTICLES OF ORDINARY MATTER

NAME	CHARGE	MASS	DISCOVERERS	COUNTRY	DATE	REMARKS
Electron	negative	1	Sir Joseph J. Thomson	BRITAIN	1897	A component of all atoms
Photon	none	0	Max Planck	GERMANY	1901	The unit of electromagnetic radiation
Proton	positive	1,836	Lord Rutherford	BRITAIN	1919	A component of all atomic nuclei
Neutron	none	1,839	James Chadwick	BRITAIN	1932	A component of nearly all atomic nuclei
Mu meson	negative	206	C. D. Anderson and S. H. Neddermeyer	UNITED STATES	1937	Discovered in cosmic rays
Pi mesons	none negative	264 273	C. F. Powell	BRITAIN	1947	Discovered in cosmic rays; a component of atomic nuclei
Lambda particle (hyperon)	none	2,182	G. D. Rochester and C. C. Butler	BRITAIN	1948	Discovered in cosmic rays
K mesons	negative none	967 973(?)	Discovered by numerous researchers independently		1948–55	Discovered in cosmic rays
Sigma particles (hyperons)	none positive negative	2,326 2,328 2,342				
Negative xi particle (hyperon)	negative	2,585				
Neutrino	none	0	Frederick Reines and Clyde Cowan, Jr.	UNITED STATES	1956	A particle formed in many decay reactions
Neutral xi particle (hyperon)	none	?	Luis W. Alvarez	UNITED STATES	1959	Last predicted particle of ordinary matter

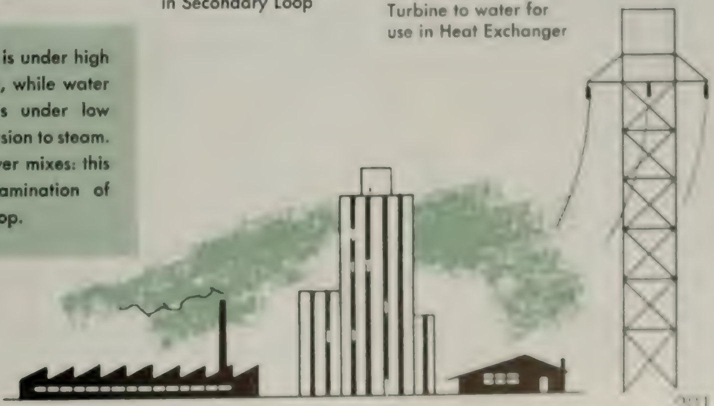
ATOMIC ENERGY: THE MODERN POWER SOURCE



Atomic power plants differ greatly in design, but all are based on the fact that uranium or plutonium in sufficiently critical mass will produce great amounts of heat through fission. One method is illustrated in a diagram of the Shippingport, Pa., plant, the first commercial nuclear power installation in the United States. In operation since 1957, the plant employs a pressurized-water reactor.


Hot water
HEAT EXCHANGER
Hot water from Reactor heats water from Condenser: resulting steam piped to Turbine
TURBINE
Driven by steam from Heat Exchanger: operates Generator
GENERATOR
Generates electric power
Steam
Cooler water
REACTOR
Nuclear fuel heats water which is pumped to Heat Exchanger
PUMP
Maintains flow of water in Primary Loop
Water
KEY:
PRIMARY LOOP
SECONDARY LOOP
PUMP
Maintains flow of water in Secondary Loop
CONDENSER
Converts steam from Turbine to water for use in Heat Exchanger

Water in the Primary Loop is under high pressure to prevent boiling, while water in the Secondary Loop is under low pressure to permit its conversion to steam. Water in the two loops never mixes: this prevents radioactive contamination of water in the Secondary Loop.



MENTAL ILLNESS IN THE UNITED STATES

With about three out of ten hospital patients in the United States in institutions for the care of the mentally ill (excluding hospitals for mental defectives and epileptics), mental illness is one of the great public problems of our time. Mental hospitals, because of overcrowding, have, in some cases, been forced to release patients before they were completely cured. Little by little, however, more room is becoming available, even though the yearly number of people admitted to mental hospitals has reached an all-time high.

The average daily patient-population (based on the average number of patients in all mental hospitals during a year) reached its peak in 1955, and thereafter began to drop. That year marked also the first widespread use of tranquilizers—drugs that calm mental patients although they do not cure mental diseases. Through the use of tranquilizers, mental hospitals have been able to release more men and women to normal life. As "outpatients" still under a doctor's care, these people may once again live at home or, often, return to work. Reduction of symptoms through tranquilizers makes this possible. Hospital population is reduced and, as a result, available facilities increase.

PATIENTS IN MENTAL HOSPITALS

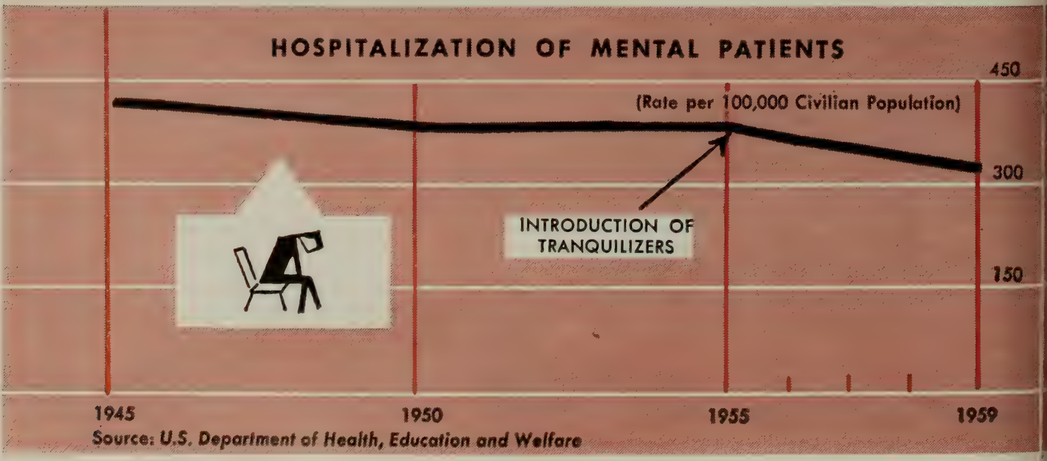
YEAR[1]	TOTAL		PUBLIC HOSPITALS		PRIVATE HOSPITALS
	NUMBER OF PATIENTS	RATE [2]	VETERANS	OTHER [3]	
1935	421,446	331.2	22,269	388,535	10,642
1940	483,448	367.2	32,227	440,543	10,678
1945	519,593	407.3	43,239	463,254	13,100
1950	578,130	384.9	51,553	512,501	14,076
1955	631,503	389.1	57,991	558,922	14,590

Number of patients at the end of each year.
Rate per 100,000 civilian population.
Comprises state, psychopathic and county hospitals.

PATIENTS IN PUBLIC HOSPITALS FOR THE CARE OF THE MENTALLY ILL

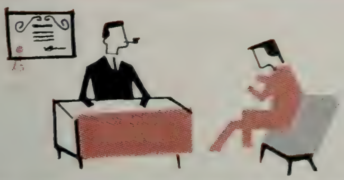
	1956 [3]	1957	1958	1959
All admissions [1]	185,597	194,479	209,503	223,225
RATE [2]	112.3	115.5	122.2	128.0
First admissions	125,539	129,278	137,061	142,881
Readmissions	60,058	65,219	72,442	80,344
Discharges	133,208	145,116	161,972	175,727
Deaths in hospital	48,236	46,848	51,294	49,640
Average daily patient population	555,103	549,330	546,337	541,717
RATE [2]	335.7	326.3	318.7	310.7

[1] Excluding transfers.
[2] Rate per 100,000 civilian population.
[3] Figures are for the fiscal year ending June 30, 1956.



Source: U.S. Department of Health, Education and Welfare

TREATMENT OF MENTAL ILLNESS

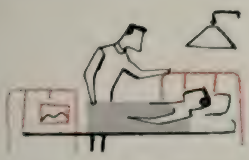


PSYCHOTHERAPY

OCCUPATIONAL AND RECREATIONAL THERAPY

DRUG THERAPY

ELECTROSHOCK THERAPY



INSULIN TREATMENT

STATE-BY-STATE PATIENT-POPULATIONS AND RATES, FOR PUBLIC MENTAL HOSPITALS

1959

STATE [1]	AVERAGE DAILY PATIENT POPULATION	RATE [2]
Alabama	7,371	232.7
Arizona	1,622	133.8
Arkansas	4,951	285.7
California	36,301	253.6
Colorado	6,012	363.5
Connecticut	8,628	358.9
Delaware	1,461	327.6
District of Columbia	6,899	616.2
Florida	8,987	192.3
Georgia	11,922	315.8
Idaho	1,029	156.1
Illinois	36,142	355.8
Indiana	11,022	238.1
Iowa	4,506	160.5
Kansas	3,937	187.1
Kentucky	6,952	225.7
Louisiana	8,425	268.1
Maine	2,939	315.5
Maryland	9,089	305.9
Massachusetts	21,461	437.7
Michigan	21,696	273.0
Minnesota	10,925	321.9
Mississippi	5,129	237.1
Missouri	11,487	272.7
Montana	1,701	249.8
Nebraska	4,342	301.3
Nevada	529	194.5
New Hampshire	2,582	443.6
New Jersey	21,651	368.1
New Mexico	940	110.1
New York	93,355	567.6
North Carolina	9,679	217.4
North Dakota	1,732	271.0
Ohio	28,317	292.6
Oklahoma	7,524	335.7
Oregon	5,041	286.4
Pennsylvania	38,666	342.1
Rhode Island	3,395	400.4
South Carolina	6,422	271.8
South Dakota	1,670	245.6
Tennessee	8,255	242.6
Texas	15,843	169.5
Utah	1,170	133.6
Vermont	1,145	308.6
Virginia	11,065	286.4
Washington	6,814	246.3
West Virginia	5,411	275.5
Wisconsin	14,966	373.8
Wyoming	631	198.4

[1] Figures for Alaska and Hawaii are not available. The District of Columbia, although not properly speaking a state, is included in the listing.

[2] Rate per 100,000 civilian population.

SOURCE: ALL TABLES: Department of Health, Education and Welfare

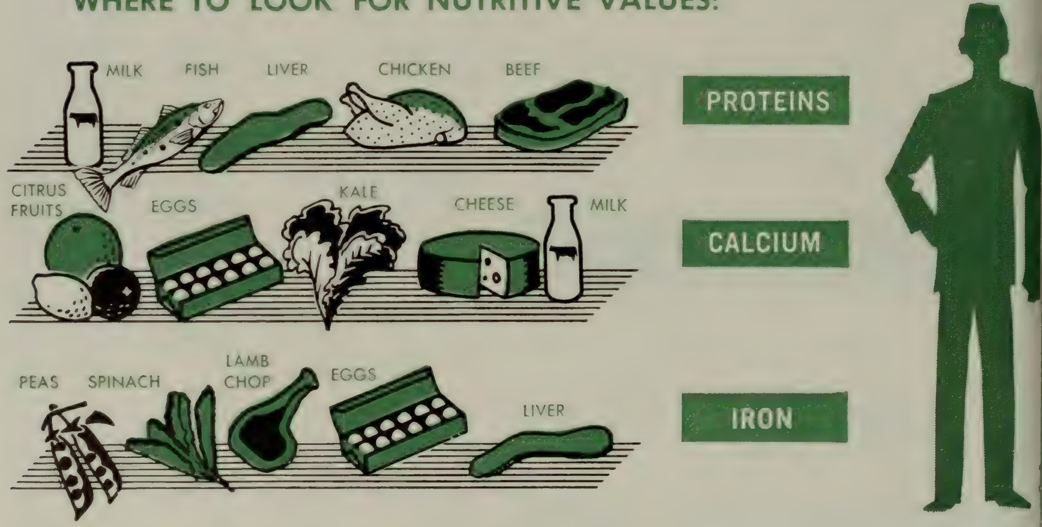
LESS FOOD, MORE NUTRITION

Since World War II, per-capita food consumption in the United States has been declining gradually in terms of pounds and calories. However, the average American diet has been improving rapidly from a nutritional viewpoint. Per-capita figures are based on total movement of food through distribution channels in relation to total population. The decline in food consumption reflects changes in the make-up of the population as well as in general physical activity. Today there are more older people, who normally eat less. Mechanization, labor-saving devices and the decrease in farm population all have contributed to reducing the energy needs that require high-calorie diets. At the same time, Americans are eating more meat, more citrus fruits, fruit juices and processed vegetables than in the past and fewer potatoes and grain products.

PER-CAPITA CONSUMPTION OF FOOD IN THE UNITED STATES

YEAR	ANNUAL PER-CAPITA CONSUMPTION (POUNDS)	INDEX OF CONSUMPTION (1947–49 = 100)	DAILY PER-CAPITA CALORIE CONSUMPTION	DAILY PER-CAPITA PROTEIN CONSUMPTION (GRAMS)	DAILY PER-CAPITA CARBOHYDRATE CONSUMPTION (GRAMS)
1944	1,657	106	3,400	100	434
1948	1,548	99	3,250	94	408
1952	1,517	97	3,240	95	397
1956	1,518	97	3,220	97	384
1959	1,488	95	3,220	97	382

WHERE TO LOOK FOR NUTRITIVE VALUES:



PER-CAPITA FOOD CONSUMPTION IN SOME MAJOR FOOD GROUPS

(In pounds)

YEAR	DAIRY PRODUCTS EXCLUDING BUTTER	MEATS, FISH AND POULTRY	FATS AND OILS	POTATOES AND SWEET POTATOES	FLOUR AND CEREAL PRODUCTS	SUGARS AND SIRUPS	EGGS (NUMBER)
1944	441	162	66	152	190	108	340
1948	413	153	65	114	170	106	377
1952	418	158	68	106	162	109	378
1956	424	179	67	107	150	108	357
1959	414	178	68	106	147	108	337

MEAT CONSUMPTION PER CAPITA

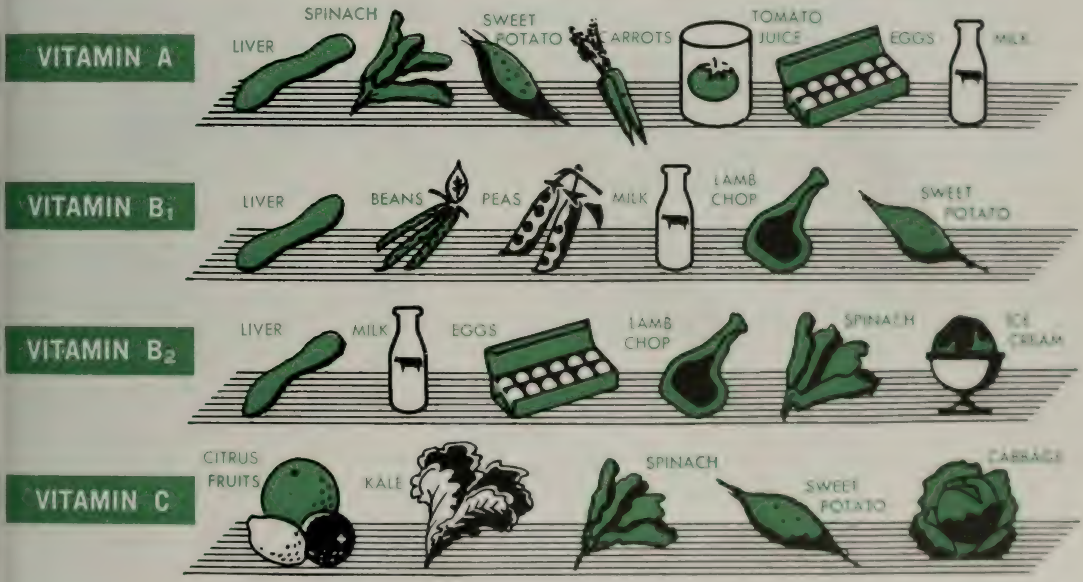
(In pounds)

YEAR	BEEF	VEAL	LAMB AND MUTTON	PORK (EXCLUDING LARD)	ALL MEATS
1944	55.6	12.4	6.7	79.5	154.2
1948	63.1	9.5	5.1	67.8	145.5
1952	62.2	7.2	4.2	72.4	146.0
1956	85.4	9.5	4.4	67.4	166.7
1959	81.6	5.7	4.5	68.3	160.1

PER-CAPITA CONSUMPTION OF FRUITS

(In pounds)

YEAR	FRESH FRUITS	CANNED FRUITS	CANNED FRUIT JUICES	FROZEN FRUITS AND JUICES
1944	141.7	9.3	10.3	2.0
1948	131.1	18.8	17.1	3.0
1952	112.5	21.0	13.8	6.6
1956	100.4	22.1	15.0	8.8
1959	101.5	22.2	13.3	8.8



PICTOGRAPH CORPORATION

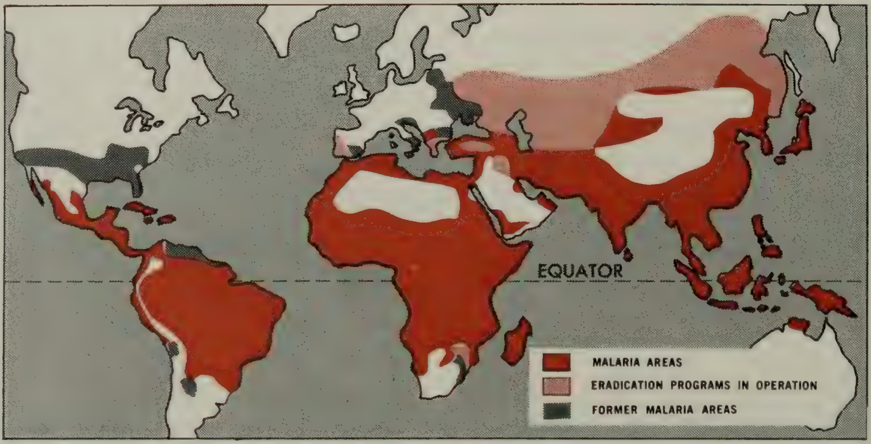
PER-CAPITA CONSUMPTION OF VEGETABLES

(In pounds)

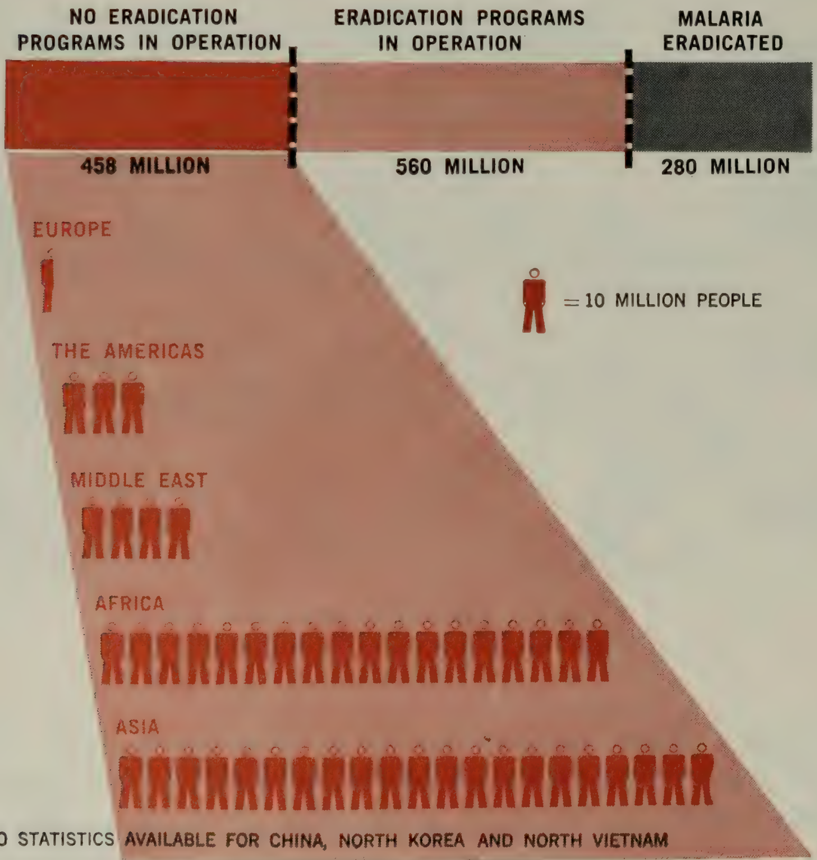
YEAR	FRESH VEGETABLES	CANNED VEGETABLES	FROZEN VEGETABLES
1944	123.5	34.4	1.63
1948	123.0	37.9	2.93
1952	111.0	42.0	5.28
1956	106.9	43.9	7.26
1959	99.6	44.9	8.08

SOURCE, ALL TABLES: Department of Agriculture

THE FIGHT AGAINST MALARIA



1.3 Billion People Live in Malaria Areas



NO STATISTICS AVAILABLE FOR CHINA, NORTH KOREA AND NORTH VIETNAM

PICTOGRAPH CORPORATION

SOURCE: WORLD HEALTH ORGANIZATION, UNITED NATIONS

PRIZES AND AWARDS: SCIENCE

Albert Lasker Awards ($2,500) for distinguished service to the physically handicapped	Dr. Paul W. Brand; Dr. Gudmund Harlem, NORWAY; and Mary E. Switzer
Atoms for Peace Award ($75,000) for 1959	Dr. Leo Szilard and Dr. Eugene Paul Wigner
Atoms for Peace Award ($75,000) for 1960	Dr. Alvin M. Weinberg and Dr. Walter H. Zinn
Dannie Heineman Prize ($2,500) for mathematical physics	Dr. Aage Bohr, DENMARK
Garvan Medal of the American Chemical Society	Dr. Mary L. Caldwell
Gold Medal of the New York Zoological Society	Captain Jacques-Yves Cousteau, MONACO
J. Lawrence Smith Medal of the National Academy of Sciences, for outstanding investigations of meteoric bodies	Dr. Ernst J. Opik, NORTHERN IRELAND
John Burroughs Medal	John Kieran, for *A Natural History of New York City*
John F. Lewis Prize ($500) of the American Philosophical Society	Dr. G. Ledyard Stebbins, for *The Role of Hybridization in Evolution*
Karl Spencer Lashley Award ($2,000) of the American Philosophical Society	Dr. Heinrich Klüver, for work in the field of neurobiology
Lenin Prizes	Sergei Vernov, Aleksandr Chudakov, Sasa Dolginov and Nikolai Pushkov, for "discovery" of the Van Allen radiation belts; and Aleksandr Leipunsky, Oleg Kazachkovsky, Igor Bondarenko and Lev Usachev, for work on breeder reactors (all from Soviet Union)
Nobel Prizes ($43,700 each)	
Chemistry	Professor Willard F. Libby, for development of radiocarbon dating
Medicine	Sir Macfarlane Burnet, AUSTRALIA, and Peter Brian Medawar, GREAT BRITAIN, for discovery of acquired immunological tolerance
Physics	Professor Donald A. Glaser, for invention of the bubble chamber
Paul Ehrlich Prize	Professor Felix Haurowitz, for achievements in immunization and microbiology
Science and Engineering Award of the Drexel Institute of Technology	Auguste Piccard and Jacques Piccard, SWITZERLAND
Stuart Ballantine Medals of the Franklin Institute	Dr. Rudolph Kompfner and Dr. John R. Pierce, for invention of the traveling wave tube amplifier; and Dr. Harry Nyquist, for work in communications systems
T. Duckett Jones Memorial Award ($6,500) of the Helen Hay Whitney Foundation	Dr. Rebecca C. Lancefield, for discoveries in streptococcal infections
Vetlesen Prize ($25,000) in geophysics	Dr. Maurice Ewing

NOTE: Unless otherwise noted, prize winners are from the United States.

WORD OF THOUGHT
Don Gibbins

BOOKS, MUSIC and ART

ART

Review of Art in 1960
William H. Gerdts 290
Danish Design for Today
Betty Pepis 294

DANCE

Dance in 1960
William Livingstone 298

LIBRARIES AND MUSEUMS

Rural Libraries
Roger H. McDonough 302
Mystic Seaport—
Living Museum of the Sea
Edouard A. Stackpole 304

LITERATURE

The Bookshelf of 1960
Wirt Williams 307
The Civil War in Books
Earl Schenck Miers 311

MUSIC

Music in 1960
Raymond A. Ericson 314
Review of Records, 1960
Julian Seaman 318
Birgit Nilsson
Nicholas G. Demos 322

FACTS AND FIGURES

Mounting Interest in Music 324
Prizes and Awards:
Books, Music and Art 325

Japanese figurine (200–399 A.D.) lent to Asia House.
THE ASIA SOCIETY

REVIEW OF ART IN 1960

By WILLIAM H. GERDTS

THE NEWARK MUSEUM

THE year 1960 was a busy one in the world of fine arts in the United States, Canada and Western Europe. A number of important retrospective shows exhibited the work of great masters who painted at the end of the nineteenth and the beginning of the twentieth centuries. Growing interest was shown in the work of modern Spanish painters and sculptors. There were, as always, a number of exhibitions of old-master works in general—paintings and drawings.

One of the most exciting shows of the year displayed well over one hundred pictures from the Thyssen collection in Switzerland, which ranks among the greatest collections in Europe of old-master paintings. This exhibition was seen early in the year in the Boymans Museum in Rotterdam, Holland, and the Folkwang Museum in Essen, West Germany. It was particularly strong in works by Northern European artists, including portraits by Hans Holbein, the younger, Albrecht Altdorfer and Rogier van der Weyden and religious pictures by Jan van Eyck and Jacques Daret. Some Italian pictures were also shown. The National Museum in Stockholm held an exhibition of Great Spanish Masters, and the Royal Academy in London presented an interesting show of Italian Art and Britain, which traced the course and the varieties of British taste in the collecting of Italian art over the centuries. The most significant exhibition of the work of a single old master was certainly the great Poussin show at the Louvre, which featured 120 paintings and an equal number of drawings borrowed from all over the world.

In the United States, the National Gallery of Art in Washington held a year-end show of French Art of the Seventeenth Century, drawn from the Louvre as well as from other collections. The Metropolitan Museum of Art in New York showed an impressive selection of Danish arts and crafts, both early and modern. The most important American show of old-master works was that of Masterpieces of Flemish Art: Van Eyck to Bosch, held at the Detroit Institute of Arts, October through December, and exhibited earlier in Bruges, Belgium. In line with the revival of interest in the work of a number of Georgian painters, there was an interesting show of the portraits, landscapes and figure paintings of Joseph Wright of Derby, at Durlacher's Gallery in New York. The Worcester Art Museum exhibited portraits by Sir Thomas Lawrence, also a Georgian painter.

The Worcester exhibition was sparked by the acquisition of Lawrence's impressive double portrait of *Mr. and Mrs. James Dunlop*. Other notable acquisitions of the year included *The Fortune Teller* by Georges de la Tour, purchased by the Metropolitan Museum. The National Gallery in London acquired Rembrandt's large and impressive *Portrait of a Man on Horseback*. Among works featured at the Morgan Library in New York City, in an exhibition of Notable Acquisitions, was an outstanding drawing by the Spanish artist Goya, his *Nightmare*.

Among the exhibitions of drawings was the spring show of seventy-five Rembrandt Drawings from American Collections; these were shown at the Morgan Library and later at the Fogg Art Museum, Harvard University. The exhibition

The Fortune Teller by the French painter Georges de la Tour, a 1960 acquisition of the Metropolitan Museum.

METROPOLITAN MUSEUM OF ART, ROGERS FUND, 1960

of Old Master Drawings held at the Newark Museum covered five centuries of great draftsmanship. A fall show of Masterpieces of Italian Drawing was held at the National Gallery in Washington. The Metropolitan Museum presented during the summer the collection of Walter C. Baker, one of the finest private collections of drawings in the United States. The Otto Gerson Gallery in New York held a show of watercolors and drawings by the English nineteenth-century artist J. M. W. Turner. Probably the most significant print exhibition of the year was the International Print Biennial held at the Cincinnati Art Museum in the spring, showing more than four hundred works in all graphic media.

There was growing activity in Canada in the presentation of art exhibitions. The National Gallery of Canada in Ottawa presented an impressive showing of Masterpieces of European Painting 1490–1840, including works borrowed from both sides of the Atlantic. This exhibition inaugurated the gallery's new museum building, which allows almost five times the space formerly available.

The United States saw two major exhibitions of ancient art. Early in the year Ancient Art in New York Private Collections was shown at the Metropolitan Museum. In October the Brooklyn Museum held an impressive show of Egyptian Sculpture from the Late Period. The most notable development in the field of Oriental art was the opening of Asia House in New York City in January; there, during the year, several fine exhibitions of Far Eastern art were held. In Europe, Treasures of the Art of India, borrowed from Indian museums and the most important show in this field ever seen on the Continent, traveled first to Essen and later to Zurich and Paris.

Less activity in early American art was noted than in previous years. The most distinguished show of paintings was American Painting 1760 to 1960, at the Milwaukee Art Center in the spring. All the paintings in this exhibit were from the collection of Mr. and Mrs. Lawrence Fleischman who are reputed to have the largest private collection of American art in the world. The Milwaukee show emphasized particularly works by members of the Peale family of Philadelphia. The Brooklyn Museum held the first major American exhibition of Victoriana, showing primarily the decorative arts, but also paintings.

An interesting show of fifty oils and pastels by Mary Cassatt was shown at the Philadelphia Museum of Art. It was not intended to cover her work completely, but included many works never seen before and borrowed from the artist's family. In the fall Knoedler Galleries in New York showed the work of James McNeil Whistler, an exhibition sponsored by the Arts Council of Great Britain. The Museum of Fine Arts in Boston presented a large exhibition of the work of Maurice Prendergast.

The year saw many important exhibitions of the works of contemporaries of these artists. The large Courbet retrospective show traveled from the Philadelphia Museum to Boston; and the Art Institute of Chicago held the largest exhibition ever seen in America of the work of the French landscapist Corot. Another significant exhibition was the large Claude Monet: Seasons and Moments, which opened at the Museum of Modern Art in the spring. This was part of a general revaluation of the work of the greatest of the impressionist artists and a celebration also of the Museum's acquisition of the monumental water-lily picture. Wildenstein's Gallery in New York held two interesting exhibitions, of Degas in the spring and of Berthe Morisot in the fall. Van Gogh's perennial popularity brought to the Montreal Museum of Fine Arts a major show of his work, drawn from the collection of his nephew, V. E. Van Gogh, and the Kröller-Müller Foundation in Otterloo, Holland. More unusual was an exhibition of Van Gogh's works held earlier in the year at the Jacquemart-André Museum in Paris and gathered from various museums, among them those in Dresden, Bremen and Oslo, with five works borrowed from Russia.

One of the most important exhibitions, historically, was the Art Nouveau show at the Museum of Modern Art, which presented furniture, ceramics, glass, silver, jewelry and printing of the turn of the century. It attempted to correlate these arts with certain aspects of contemporaneous painting and sculpture. The show also indicated a revival of popular interest in special fields, such as the glass of Louis Comfort Tiffany, on the part of collectors and museums. A small but fascinating exhibition held early in the year at the Peridot Galleries in New York was devoted to the work of the little-known Italian impressionist sculptor Medardo Rosso, most of whose work was done in a rather perishable medium, wax.

Among the exhibitions devoted to the major artists of the twentieth century, first place was certainly held by the great summer Picasso show at the Tate Gallery in London. The Musée National d'Art Moderne in Paris did a retrospective exhibition of the work of the surrealist Max Ernst. Smaller exhibitions of significance included one devoted to the Uruguayan modernist Joaquin Torres-Garcia, hitherto relatively unappreciated, at the Rose Fried Gallery in New York, and a fine double show of the paintings and sculptures of Jean Arp and Sophie Taeuber-Arp at the Galerie Chalette, also in New York. This gallery also held a large, comprehensive exhibition of the work of twentieth-century geometric abstractionists of Europe and America, including loans from as far away as Poland.

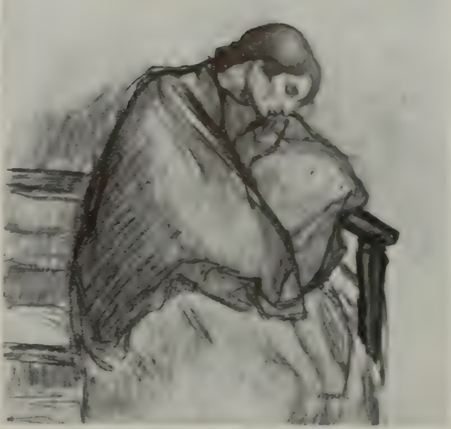
NATIONAL GALLERY OF ART

Head of a Boy with a Book by G. B. Piazzetta in the National Gallery's exhibit of Italian drawings.

A large number of exhibitions were devoted to the twentieth-century art of single nations. These included the show of Modern Swiss Art, held at the Musée National d'Art Moderne in Paris, which featured the work of such painters and sculptors as Hodler, Le Corbusier, Sophie Taeuber-Arp, Klee and members of the Giacometti family. The Parke-Bernet Galleries in New York early in the sum-

PITTSBURGH INSTITUTE OF ART

Jan van Eyck's portrait of Margaret van Eyck in Masterpieces of Flemish Art: Van Eyck to Bosch.



SOLOMON R. GUGGENHEIM MUSEUM

An Isidro Nonell water color (1903) in a Guggenheim exhibition called Before Picasso; after Miro.

mer held a show of the Arts of Belgium, 1920–1960, including not only painting and sculpture but stained glass, ceramics and tapestries.

A most interesting feature of the year was the growing interest in modern Spanish art, which was first seen in the 1958 Venice Biennale. Tooth and Sons in London held an exhibition of the New Painting of Spain, and several galleries in New York City held one-man and group shows of the work of contemporary Spanish artists. In the summer in New York, Spanish art could be seen in many places, particularly at the Museum of Modern Art and the Guggenheim Museum, both featuring the work of such artists as Tapies, Canogar, Millares and others. Nineteen-sixty was also the year of the Biennale in Venice.

In the realm of contemporary American arts, the Whitney Museum in New York held a group of one-man shows of Philip Evergood, Milton Avery, Lee Gatch, Jose de Creeft, Hugo Robus and others, while the Seattle Museum held an important show of its local artist Mark Tobey. The autumn witnessed an interesting historical show at the Walker Art Center in Minneapolis of the precisionists, among them Georgia O'Keeffe and Charles Sheeler. One of the most significant developments in American art was the interest in a new "figurative tradition" —the concentration upon the painting of the human form—particularly through an awareness of new developments on the west coast by such figurative artists as David Park and Elmer Bischoff.

The Tate Gallery acquired funds for the purchase of American art; it will have the first major collection of American work outside the United States. The Stuttgart Museum acquired twenty-nine paintings from the Ragnar Moltzau Collection, including works by Picasso, Matisse, Modigliani, Bonnard and Renoir, giving its collection appreciable significance. The National Museum of Israel was given an outstanding collection of twentieth-century sculpture by the American collector Billy Rose, which included works by Rodin, Maillol, Lipchitz and Epstein.

Auction prices continued to soar. A benefit sale held in New York at the Parke-Bernet Galleries for the Museum of Modern Art netted over $870,000. The highest bids were $200,000 for a Cezanne still life and $145,000 for a painting by Braque. The most surprising sale of the year took place on March 23 at Sotheby's in London, when the early Gainsborough portrait of *Mr. and Mrs. Robert Andrews* brought $364,000. Several paintings by Canaletto also brought high prices.

Danish Design for Today

Sculptural chair of teak by Finn Juhl is a typical, much-copied Danish design.

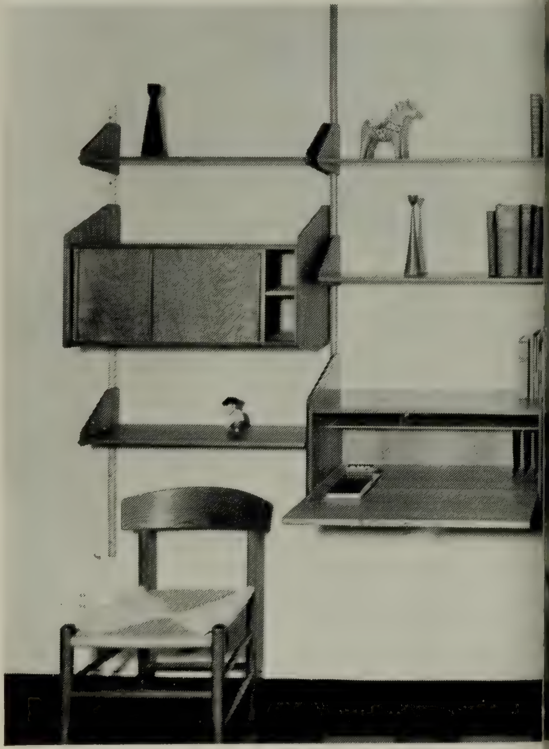
By BETTY PEPIS

Author and Lecturer

IT is rare indeed that royalty deigns to look at modern design. Yet such an event occurred in 1960 when the King and Queen of Denmark flew all the way from Copenhagen to New York City to officiate at the opening of an exhibition at the Metropolitan Museum of Art.

Although the emphasis in this exhibition, known as the Arts of Denmark, was on modern arts, artifacts and crafts for the home, a segment of the show dated from prehistoric times (represented by such objects as amber ornaments and gold bangles). Old and new combined to prove that the Danish have an innate taste for neatness and good proportion, for grace and natural materials. It is just these qualities which have, in less than a decade, earned for Danish importations a permanent place in American homes.

Chrome chair with bentwood back by Poul Kjaerholm shows Danish design in more advanced modern mood. With other items above, it was shown at the Metropolitan Museum.



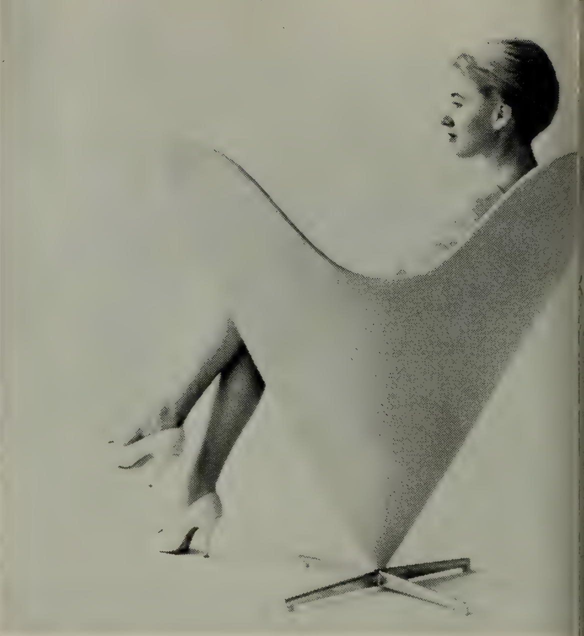
Ceramics, like other handcrafted accessories, have reached a point of perfection in Danish production. They range from simple stoneware like this royal Copenhagen bowl to delicate porcelain figurines.

Sterling silver is a material the Danes enjoy and understand. It is they who have put the imprint of modernity on this precious material. The sauce boat is by Flemming Lassen done for A. Michelsen.

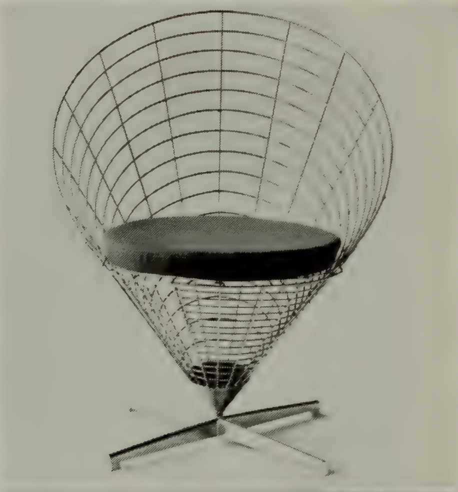
Stainless steel flatware like this set by Arne Jacabsen, with a sufficiently sleek appearance to be used on the most formal table, is notable for unconventional tines, blades.

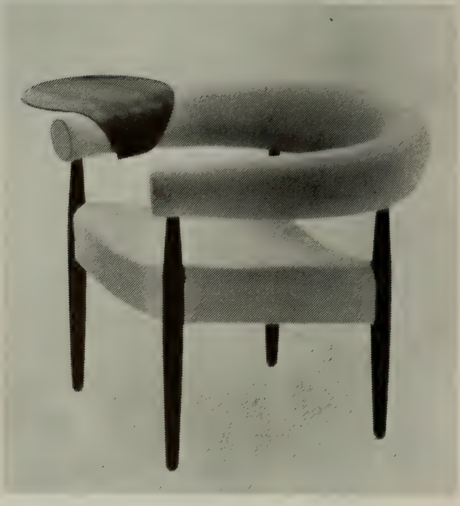
Complex wall-hung units like the arrangement of teak shelves and storage units below have been highly developed by designers of Copenhagen. Ideal for small rooms, they permit great flexibility.

Shapely curves of the ice-cream-cone chair by Vernon Panton have the look of free-form sculpture floating in space. The chair swivels around but can be locked in any one spot.

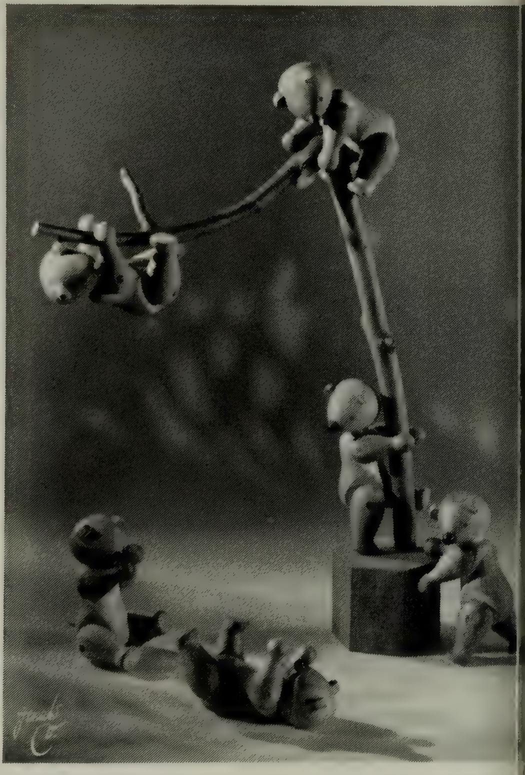


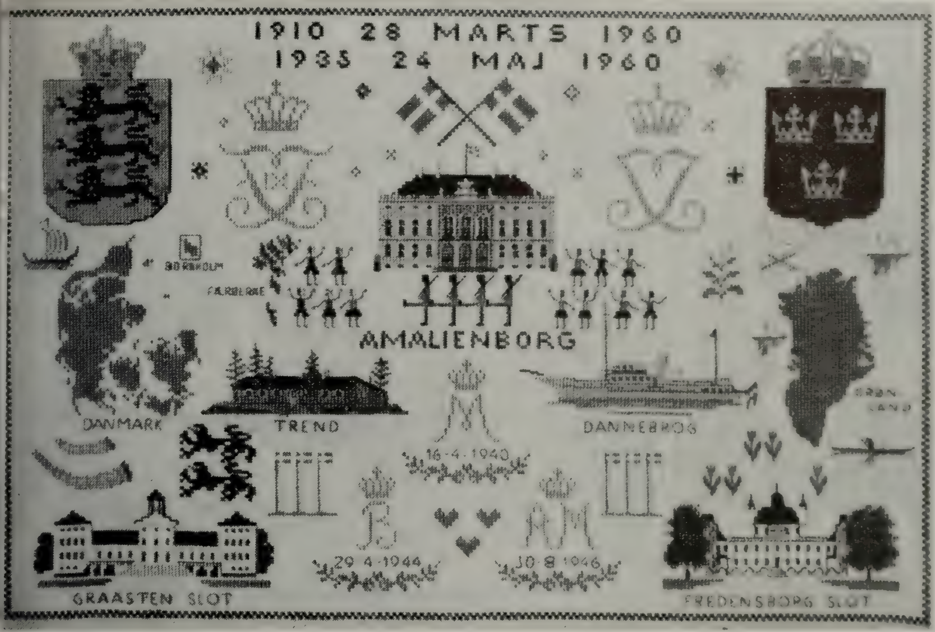
Another version of the cone chair has back of wire webbing which gives it see-through look. Below, Danish ingenuity is neatly expressed in a tubby chair designed by a husband-and-wife team: Nanna and Jorgen Ditzel. The detachable teak tray can be easily removed.





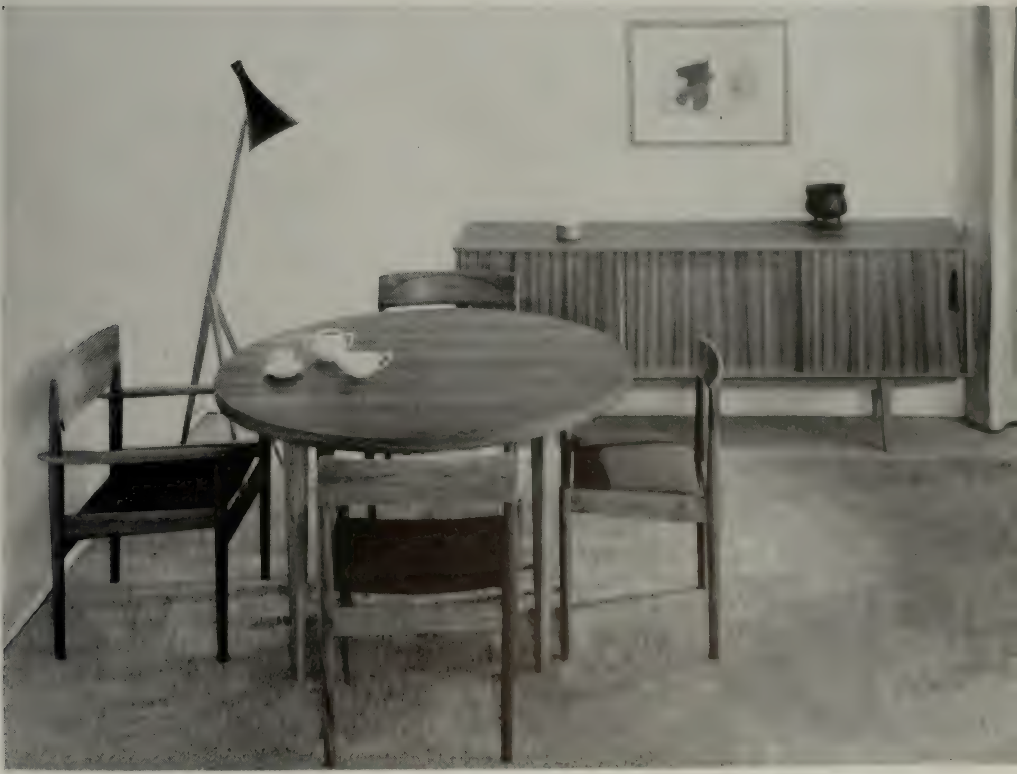
Wooden bears by the late Kay Bojesen may be among the world's most famous toys. Also in this jointed menagerie are convincing replicas of elephants and most acrobatic monkeys.

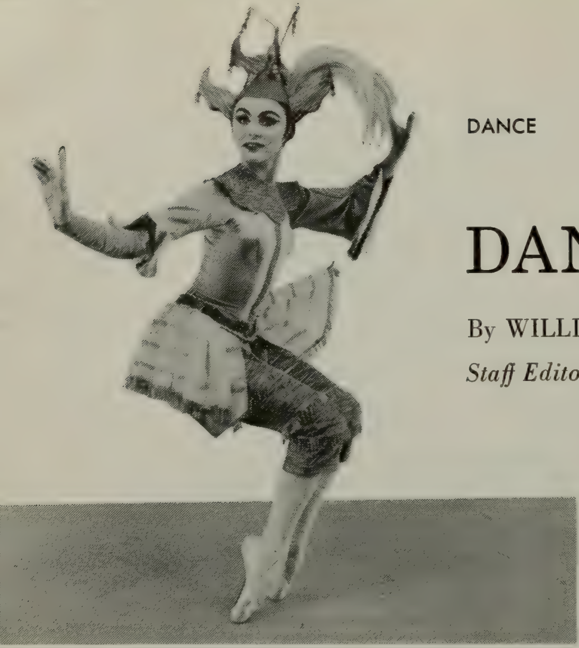




Embroidery techniques shown in a modern sampler by Gerda Begtsson have not been neglected. Among other traditional crafts are tapestry and rug weaving.

Dull wood finishes, use of teak, round lines and interesting play of intricate grains are Danish influences that have invaded American furniture design.





NEW YORK CITY BALLET

DANCE IN 1960

By WILLIAM LIVINGSTONE

Staff Editor, The Encyclopedia Americana

Patricia McBride in the New York City Ballet's Iran-inspired *Figure in the Carpet.*

INTERNATIONALISM was a dominant aspect of dance in the United States in 1960. The country was visited by numerous ethnic and folk-dance groups from abroad and by two royal European ballet companies. In addition, the American Ballet Theatre toured Russian cities, repaying the visit of the Bolshoi Ballet to the United States in 1959. The company made this tour under the auspices of the President's Special International Program for Cultural Presentations.

The announcement in December 1959 of the official selection of the American Ballet Theatre for the Russian trip was met by certain misgivings in the United States. In Russia, ballet has a tradition of two centuries of careful nurturing and high honor for the art. Many Americans who had recently been somewhat overwhelmed by the performances of the Bolshoi Ballet wondered whether any American company could make a really good showing in the Soviet Union. Furthermore, the American Ballet Theatre was not at that time in shape to perform anywhere. Founded in 1940 under private patronage, it had quickly become a great company. Since it had no permanent home or state subsidy, however, it was doomed to endless touring and ultimate deterioration. It had disbanded after its foreign tour in 1958. Although the projected Russian tour was to be preceded by a brief season in New York and performances in Cuba and Europe, it was feared that the evidence of the company's all too hasty reorganization would be apparent to critical Russian balletomanes.

The company marked its twentieth anniversary year with a three-week engagement beginning April 19 at the Metropolitan Opera House in New York. The repertoire included such works as *Pillar of Fire, Jardin aux Lilas, Billy the Kid, Rodeo, Fancy Free, Theme and Variations, Graduation Ball, Les Sylphides, Pas de Quatre* and *Fall River Legend,* many of them restaged by their original choreographers. New works were *Lady from the Sea* (Birgit Cullberg-Knudaage Riisager), based on the Ibsen play, and *Dialogues (Serenade for Seven)*, with choreography by Herbert Ross and music by Leonard Bernstein.

The company was headed by Nora Kaye, Lupe Serrano, Ruth Ann Koesun, Erik Bruhn, John Kriza, Scott Douglas and Royes Fernandez. The *corps de ballet* and the group of secondary dancers were largely new. Guest stars were Alicia Markova, Alicia Alonso and Igor Youskevitch. The public responded to the company's reappearance with a record advance ticket sale of $100,000.

The performances of the company showed that a great deal of effort by many talented people had gone into its rehabilitation. The critics gave special praise to Miss Serrano and to Messrs. Bruhn, Douglas and Fernandez. The performances of *Giselle* by Miss Alonso and Mr. Youskevitch were quite as inspired as they were remembered to be in former years. Miracles, however, had not been wrought in so short a time. The new ballets proved to be less interesting than the old, and the old ones were in most cases rather pallid reflections of former glory.

Those who favored the Soviet visit argued that it would preserve a great repertoire a little longer. John Martin, dean of American dance critics, was the most articulate opposition spokesman. He stated that for the company, in such poor condition, to represent the United States in Russia would result in "profound national humiliation."

The American Ballet Theatre began its tour in Lisbon, Portugal, and concluded it with six weeks in Leningrad, Moscow, Kiev and Tiflis. The first American ballet to appear in the Soviet Union, the company made its Russian debut on September 13 at the Stanislavsky Theatre in Moscow. The varied program opened with *Theme and Variations* (Balanchine-Tchaikovsky), which was received with some applause. The modernism of Agnes de Mille's cowboy ballet *Rodeo* was completely unfamiliar to the Russians, who found much of it perplexing but enjoyed some of its humor. The high spirits of David Lichine's *Graduation Ball* charmed them. Predictably, they liked best the familiar *Black Swan pas de deux*, which they greeted with real enthusiasm. It was danced by Maria Tallchief and Erik Bruhn, two of the West's finest classical dancers.

The professional verdict was a bit less warm than that of the Russian audiences. Moscow critics felt that the Americans lacked the authority and classicism of Russian dancers, but the Soviet dancers themselves made polite, if not very enthusiastic, comments. The newspaper *Izvestia* stated that the company "left a favorable impression."

England's Royal Ballet arrived in the United States on September 6 to begin a four-week season in New York, followed by a tour of twenty-five other cities. As much beloved by American audiences as it is at home, the Royal Ballet (formerly Sadler's Wells Ballet) is not many years older than the American Ballet Theatre. It has enjoyed the matchless blessings denied its American contemporary—a permanent home, with a training school, and a Government subsidy. Consequently it has grown into a national institution that can be exhibited anywhere with pride. The company demonstrated again that in its field it has no peer in the West. The backbone of its repertory was still formed by those perennial favorites it does so well: *The Sleeping Beauty*, *Le Lac des Cygnes* (*Swan Lake*), *Giselle* and *Les Sylphides*. The four new works were *La Fille Mal Gardée*, *Ondine*, *Antigone* and *Le Baiser de la Fée*. Margot Fonteyn, formerly the company's prima ballerina, was now billed as a guest artist. The real star of the season, however, was Frederick Ashton, who provided the choreography for two new full-length ballets which were smash hits.

Ondine, one of these hits, is a tragic fantasy based on a story by the German Friedrich de La Motte-Fouqué and set to modern music by Hans Werner Henze. It

Classic pose in a classic ballet—*Les Sylphides*—as danced by England's superbly trained Royal Ballet.

HUROK ATTRACTIONS, INC.

takes place in the late eighteenth century and is the story of a mortal, Palemon, who marries Ondine, a sea sprite. This eventually results in his death and her return to the sea. *Ondine* is a brooding work with strange psychological overtones in a macabre Gothic setting.

The title role was danced by Margot Fonteyn, for whom it was created, and it is one of her finest parts. Miss Fonteyn danced with exquisite refinement and as though technical limitations were nonexistent. Michael Somes portrayed Palemon with his customary dignity.

One work of this caliber alone would entitle a choreographer to be called a genius, but Ashton devised another on the same level of achievement—the comedy *La Fille Mal Gardée*. Dating from 1786, this is one of the oldest ballets in the current repertoire, but little remains of the original choreography. Ashton completely recreated it to go with a witty score forged by John Lanchbery from Ferdinand Herold's music for an early nineteenth-century production.

It is the engaging story of Lise, a peasant girl whose mother wishes to prevent her from marrying the young man she loves in order to make a more ambitious match with the foolish son of a wealthy landowner. The young lovers outwit the scheming mother and true love triumphs. Mr. Ashton's flair for farce has rejuvenated the ancient jokes and situations to make them truly funny again. The role of the mother, traditionally performed by a man, was taken by Stanley Holden, and that of Alain—the stupid suitor—by Alexander Grant. Although the British taste for pantomime was fully indulged, there was a great deal of virtuoso dancing by Nadia Nerina and David Blair as the lovers. Their *pas de deux* at the end of Act I was stunning.

The company's newly restudied production of *Giselle*, supervised by Ashton and Tamara Karsavina, presented Margot Fonteyn and Michael Somes in a most satisfying version of the masterpiece of ballet's Romantic period. Passages that are usually omitted had been restored and there was a general heightening of the emotional values of the work. Kenneth MacMillan's new choreography to Stravinsky's *Le Baiser de la Fée* had considerable charm and was impressively danced by Svetlana Beriosova, Lynn Seymour and Donald Macleary. In view of the company's many outstanding triumphs, no one felt much like complaining that *Antigone* (John Cranko-Mikis Theodorakis) was a lesser work.

New York balletomanes did complain that they were completely ignored by the Royal Danish Ballet on its second tour of the United States. It began in San Francisco in mid-August and continued across the country, ending late in October with performances in Washington, Philadel-

At home and on tour abroad the American Ballet Theatre offered a varied repertoire: opposite page, the high-spirited *Graduation Ball,* choreographed by David Lichine; below, Erik Bruhn and Maria Tallchief in the *Black Swan pas de deux;* at right, Lupe Serrano dances brilliantly in *Don Quixote.*

PHOTOS THESE PAGES, AMERICAN BALLET THEATRE

phia and Hartford. One of the world's oldest companies, its unbroken tradition reaches back into the eighteenth century. The choreography of *The Whims of Cupid and the Ballet Master,* which the company still performs, dates from 1786! (The distinctive note in its repertoire is provided by the nineteenth century Romantic ballets of Auguste Bournonville, which have been lovingly preserved and continuously performed in Copenhagen.) In the past decade the Royal Danish Ballet has taken a prominent place on the international scene, generating good will for Denmark and respect for its cultural achievements.

In 1960 it showed Americans its interpretations of such familiar ballets as Balanchine's *Serenade, Night Shadow* and *Apollon Musagètes,* as well as Jerome Robbins' *Fanfare* and Lichine's *Graduation Ball.* The high point of the tour was a gala performance in Washington, October 13, attended by King Frederik IX and Queen Ingrid of Denmark. The program included *Apollon Musagètes* and the second act of Bournonville's *La Sylphide,* an enchanting work stylishly danced by Margrethe Schanne and Flemming Flindt. It ended with the last act of Bournonville's *Napoli,* a festive exhibition piece.

Israel, Poland, Japan, the Philippines and Guinea were only a few of the other countries whose ambassadors of the dance were received with enthusiasm in numerous cities of the United States during 1960.

Although the New York City Ballet remained at home, quietly presenting some of the most finished performances in its history, it was not out of the international picture. Early in the year it made a gracious gesture with *Pan America,* a salute to Latin America, which consisted of eight new ballets with music by composers from that many Latin countries. It opened with considerable diplomatic fanfare, but the critics gave it higher marks on good intentions than on artistic merit.

The company was more successful in April with *Figure in the Carpet,* sponsored by Mohammed Reza Pahlavi, shah of Iran, and produced in honor of a congress of the International Association for Iranian Art and Archaeology. Choreographed by Balanchine to Handel's *Fireworks Music* and *Water Music,* it was a rich dance spectacle. The first of its two parts illustrated the weaving of a carpet, and the second was an elaborate entertainment at an oriental court, featuring an elegant *pas de deux* by Jacques d'Amboise and Melissa Hayden. For its winter season the company announced *Don Sebastian,* a new work in honor of the centennial celebration of the unification of Italy.

RURAL LIBRARIES

By ROGER H. McDONOUGH

Director
New Jersey State Library

MILLIONS of Americans living on farms and in small towns throughout the United States today have public-library service for the first time. Millions more have better libraries than in the past. This has been made possible through the Library Services Act of 1956, which was extended by Congress in 1960 for an additional five years. The original act, signed by President Eisenhower on June 19, 1956, is one of the great milestones in the history of American public libraries. It is the most significant action ever taken by the Federal Government to share with states, counties and municipalities the goal of providing good library services for all Americans. The Library Services Act authorized the Federal Government to spend up to $7,500,000 annually for five years for grants to the states for the extension and improvement of rural-public-library services. Now Congress has extended the act through June 30, 1966. Under its terms, funds are allotted to the states on the basis of their rural population. Those funds are matched by the states on a basis of per capita income. State library extension agencies administer the funds under plans approved by the Federal Commissioner of Education.

The American Library Association, which sponsored the Library Services Act, has long been concerned about the lack of good books in rural areas. Prior to passage of the act, 27,000,000 Americans in rural areas had no library services at all and 53,000,000 more had poor or inadequate service. Today it is estimated that 30,000,000 of these people have benefited through new or improved library facilities.

As soon as the act was passed, librarians went to work with vigor and enthusiasm to get state plans under way. By 1960 they could point to an impressive record of accomplishment. More than 800 rural counties throughout the nation had new or improved service. More than 120 new bookmobiles, full of attractive and interesting books for readers of all ages, were carrying their treasures over the back roads of America—from Maine to Florida, from California to Alaska. More than 5,000,000 new books and other educational material had been added to the existing supply.

One of the most interesting features of the program is the great variety of plans that have been developed by the different states. Rhode Island has bought 50 sets of encyclopedias, and South Carolina purchased 8,000 reference works for reloan to libraries in its rural areas. Many states have established film libraries, and Vermont and New Hampshire have worked out a co-operative film circuit covering both states. Nevada and Pennsylvania have completed state-wide library surveys, and 17 states have in-service library-training programs. The importance of having qualified professional personnel is recognized as an important factor in the sound development of the rural-library program. Many states have strengthened their library-extension agencies by adding professional members to their staffs. At least 90 field consultants have been added, an increase of 80 per cent over the total of field-staff personnel in 1956. Twenty states have set up centralized-cataloguing departments to help local libraries.

One indication of the effectiveness of the Federal-aid plan is the response of individual states and communities in terms of financial support. State funds

A part of the youth section in the new library building in Whitefish, Montana. This area has its own card catalogue and furniture for children.

AMERICAN LIBRARY ASSOCIATION

"What makes it fly?" These children will know how to make their airplane fly when they have read the book provided by the regional library service.

for libraries have increased more than 45 per cent since 1956, and local support is up more than 54 per cent. In Whitefish, Montana, for example—a small town (population 3,268, 1950 census) in the northern part of that state—the Library Services Act helped to provide the spark to put over a bond issue for a new library building. The librarian commented: "We have been operating the library only six months in our new quarters and much of that time has been spent in organizing, so it is difficult to predict the results. The record shows a 74 per cent increase in book circulation for this short period compared to that for the same period a year ago. The children, particularly, seem to have had the doors of a whole new world opened to them. Teachers enjoy taking their classes on a tour of the library. The adults seem proud and happy with the whole new city building—even those who were at first opposed to the bond issue. In general, the entire community seems to be more aware of the responsibilities of the library. . . ."

It is only in terms of individual human beings, however, that the accomplishments of the Library Services Act program can really be measured. In thousands of instances, individuals have responded with enthusiasm to the chance to borrow books from a public library for the first time. In Kentucky, a small boy ignored the usual attractions at a county fair and read books in the bookmobile for three solid days. In northern Montana, a mother and her son rode ten miles on horseback every six weeks to take home their next batch of reading in a gunny sack. In New Jersey, a "retarded" youngster's reading ability improved measurably as the result of a reading plan worked out by the bookmobile librarian and the classroom teacher. And an Indian girl in Arizona, married and the mother of a tiny baby, embarked on a program of self-education by borrowing the book *How to Get a High School Education at Home.*

One of the outstanding benefits of the program has to do with the reference books that have been supplied to regional, county and local libraries. Many rural youngsters bent upon careers in science now are able to borrow the very latest books on physics, chemistry and the whole literature of the space age. It is impossible to doubt that the entire American educational system has been strengthened as a result of this program.

The widespread acceptance of this program throughout the country and the splendid accomplishments it has made possible appear to have convinced Congress of the wisdom of allowing a full decade for development of rural libraries under the Library Services Act.

MYSTIC SEAPORT—
Living Museum of the Sea

By EDOUARD A. STACKPOLE

Curator
Mystic Seaport

THE earliest pages of American history were written by mariners. During the first two centuries the adventures of these seafarers reflected the restless surge of the nation's growth, and many of the country's most interesting historical chapters are concerned with seaport activities alone. The full significance of various aspects of early American maritime history is made clear at Mystic Seaport, a reconstruction of a typical early New England seafaring community. The Seaport is a unique and colorful living museum of the sea, developed by the Marine Historical Association in Mystic, Connecticut. In the mid-nineteenth century the Mystic River valley was the shipbuilding center of New England. In the little river communities, Mystic shipwrights and seafaring folk built vessels of many kinds and then sailed them great distances, often around Cape Horn.

Three decades ago a small group of men founded the association, combining their efforts to preserve the maritime relics that tell the story of that famous little corner of New England that includes Stonington, Mystic and Groton. They collected half models (ship models showing interior design), logbooks, paintings and rigged models. Eventually they founded a modest but comprehensive marine museum in a small brick building that had once been a part of a large woolen-mill enterprise in Mystic. Then after several years a happy circumstance led to the creation of Mystic Seaport and gave the Marine Historical Association the American maritime prestige that it enjoys today.

Early in November 1941 the late Clifford B. Mallory, then president of the association, completed his plan to bring to Mystic the one-hundred-year-old square-rigged whaler, the Charles W. Morgan, the only surviving Yankee wooden whaleship. Like a gray ghost of her former self, the battered and dingy ship was towed from New Bedford, Massachusetts, to her present berth at Mystic. Her coming inspired plans for a typical New England seaport to be built on waste land along the banks of the Mystic River. With the large, abandoned woolen mill on one side and on the other the high ground that marked the site of the former Greenman shipyard, the project was launched.

Today Mystic Seaport occupies twenty-five acres of land along the tidal estuary of the river. Several large museum buildings (the Stillman, Mallory, Wendell and North buildings) house outstanding collections of ship models, figureheads, marine paintings, scrimshaw (objects, often of ivory and shell, ornamented by engraving, with ink or pigments rubbed into the incised lines) and naval relics of various other kinds. The most recent of the museum buildings is a planetarium, with the most up-to-date type of equipment.

The formal buildings for the housing of collections are only a part of Mystic Seaport, which is actually an authentic reconstruction of a seaport town of the middle nineteenth century. On the cobbled waterfront street are located shops, dwellings and warehouses. Moored along the waterfront are the ships of another day, whose masts and squareyards tower above the tiny village. Beside the Charles W. Morgan, now nearly restored, is the oldest registered merchant vessel in the United States, the schooner Australia, a blockade-runner during the Civil War. Close by is the white schooner Bowdoin, the only wooden craft ever built expressly for Arctic exploration; she made twenty-six voyages to the far north un-

LOUIS S. MARTEL, FOR MYSTIC SEAPORT

Reconstructed shops and houses from a bygone day line the waterfront at Mystic Seaport. In the foreground, the blockade-runner Australia lies at anchor.

der her indomitable skipper, Admiral Donald B. MacMillan. Here, too, is the little square-rigger Joseph Conrad, which once sailed around the world with Alan Villiers and now serves as headquarters for the Seaport Youth Training Program. On the Joseph Conrad, Sea Scouts are given instruction in navigation, ship routine and small-boat handling. (In the planetarium, also, they learn the principles of navigation by the stars.) Swinging at their moorings in the river are numerous smaller craft, including the Morgan's whaleboats, a Friendship sloop, a New England boat and a cutter.

Several boat sheds house all manner of craft—fishing boats, pulling (row) boats and early types of yachts. Among these are a Nomansland fisherman, a plank-on-edge cutter and a famous Whitehall boat. Standing in colorful array on the north green is a collection of restored sailing craft that delight even the casual observer. Here is the sandbagger sloop Annie, of unique design; the Roosevelt sloop Vireo; the Herreshoff one-design Fiddler, veteran of many a Buzzards Bay race; and the Olympic games (1956) racer, the sharpie Tinecke.

Close at hand are the white Fishtown Chapel, the tiny red schoolhouse, the historic Greenman and Buckingham dwelling houses, Stone's general store and even an authentic reconstruction known as Schaeffer's Spouter Tavern.

Around the perimeter of Mystic Seaport stretch hundreds of feet of wharves that serve as docking places for numerous visiting craft. At the other or up-river end of the Seaport, jutting out from the green shore, is the Cruising Club wharf, which also accommodates a large number of craft. Here stands the oldest yacht-club building in the United States, Station Number 10, original home of the New York Yacht Club, moved to Mystic from Long Island. Built originally in Hoboken, New Jersey, in 1844, this fascinating little structure houses many yachting relics, including the rudder of the famous schooner America, which captured the Queen's Cup in 1851.

As the visitor strolls through Mystic Seaport, he may explore the Greenman Shipyard, which is once more an active shipyard, with launching ways, a railway, boat sheds and so on. Here were built such famous craft as the David Crockett, which made twenty-seven passages around Cape Horn to San Francisco and home again, a record never equaled by any other sailing vessel. Standing today about the reconstructed shipyard are various buildings similar to those that played a large part in servicing and outfitting the approximately one hundred vessels launched at the original shipyard. Among these authentic old buildings are the sail loft, the shipsmith shop, the counting house, the apothecary, the ship-carpenter shop, the ropewalk and the spar shed.

Here, as elsewhere throughout Mystic Seaport, the effort has been made to re-create the very atmosphere of the seafaring past. On the shipyard's launching ways, where clippers such as the Seminole once slid into the river, is now the restored Maine pinkie, Regina M. (A pinkie is a boat with a narrow stern.) As the visitor passes by he can smell the pungent odor of tarred rope in the riggers' loft and hear the ring of the caulkers' irons on the pinkie's hull. Also, as the restoration of the Morgan proceeds, the visitor hears the thud of the ship carpenters' mauls (hammers). The sights and sounds of today re-create the scene very much as it must have appeared years ago. Like the salty tang of the tide coming up the river, they are parts of the true picture of an old seaport. From the sedate and cloistered quiet of the Buckingham House and its seventeenth-century kitchen to the ringing sound of the anvil and the acrid smoke of the forge in the blacksmith shop, the spell of the years lies upon the village.

In many cases whole buildings were moved from their original sites and rebuilt at the Seaport. In the weaving shop, in the Edwards House on Seaport Street, the visitor can watch a weaver demonstrating the early art of weaving. In the Pugsley Clock Shop a custodian is on hand to explain how the old chronometers and watches work. The "apothecary" in the apothecary shop presides over the herbs, drugs and remedies, all in authentic bottles and jars, that were in common use during the middle nineteenth century. Other craftsmen, all skilled in nineteenth-century arts, carry on much of the work needed for restoration and maintenance of Mystic Seaport buildings, ships, small craft, exhibit materials and early gear.

This national maritime shrine epitomizes one of the finest of American traditions—the age of sail. Not only is it open to visitors but, since 1954, a six-week course in American maritime history has been held there each summer, in affiliation with the University of Connecticut. Both students and visitors come to understand more deeply how the Seaport people developed that sense of individual responsibility and self-reliance that is the fundamental quality in the American pattern of living. With their courage and perseverance they developed something more than a way of doing business and governing themselves. They, and others like them, supplied the basic fundamentals of character that created a nation which is today one of the great bulwarks of human freedom.

LOUIS S. MARTEL, FOR MYSTIC SEAPORT

The Stillman Building is one of several museums that contain mementos of the history of sailing vessels.

THE BOOKSHELF OF 1960

By WIRT WILLIAMS
Sunday Book Editor
THE LOS ANGELES TIMES

BECAUSE 1960 was a presidential-election year in the United States, American books reflected the national preoccupation with politics. Certainly the year saw more books dealing with public affairs than had any other in a long time.

Former President Harry S. Truman headed an impressive list of memoir writers with his *Mr. Citizen.* Joseph W. Martin, long the Republican leader in the House of Representatives, wrote *My First Fifty Years in Politics.* Republican Senator Barry M. Goldwater (Arizona) explained his philosophy in *The Conscience of a Conservative.* Bernard M. Baruch published an epochal account of his experience in finance and government in *The Public Years.* Elting E. Morison, in *Turmoil and Tradition,* explored the life and times of Henry L. Stimson, and Felix Frankfurter reminisced at length in *Felix Frankfurter Reminisces.*

Early in the year various speeches of presidential candidate Senator John F. Kennedy were brought together and edited by Allan Nevins in *Strategy of Peace.* Kennedy's opponent, Vice-President Richard M. Nixon, apparently heeded the old Eastern maxim, "Would that my enemy had written a book!" and refrained from producing one himself. Both candidates and several of Senator Kennedy's preconvention rivals were subjects of biographical studies, however. Professor Arthur Schlesinger, Jr., one of the best-known moderate liberals and a member of Democratic candidate Kennedy's advisory board, performed the rarely duplicated feat of having two books on the best-seller list at the same time. More remarkable still, both books were works of substance. One was an additional volume in Professor Schlesinger's history of the Franklin D. Roosevelt administration and was called *The Politics of Upheaval;* the other was a partisan election exhortation—*Kennedy or Nixon: Does It Make Any Difference?*

The exposé—long a staple for the newspaper and magazine—became increasingly popular in books. Vance Packard followed his earlier successes in this field with *The Waste Makers,* an attack on the planned obsolescence of consumer goods. In *The Operators,* Frank Gibney hit at "the society of the expense account," and William Michelfelder's target in *It's Cheaper to Die* was the high cost of doctors and drugs.

The Longs of Louisiana, by Stan Opotowsky, and *Dynasty: the Longs of Louisiana,* by Thomas Martin, were good journalistic studies of the famous family. Allen Drury's *Advise and Consent,* a novel about Washington and the Senate's confirmation of a secretary of state, was highly journalistic in method and, though published in 1959, continued to be one of the two best sellers in fiction during the year.

The man of the year in imaginative writing, according to many critics, was Lawrence Durrell. *Clea,* the fourth and last volume in his tetralogy *The Alexandria Quartet,* was published in 1960, and the entire four-volume work became available in a boxed set for the first time. It was acclaimed, and properly, as one of the century's masterworks. His *The Black Book* was published for the first time in the United States, as were his books of poems, both of which were highly praised by the critics. Durrell's *Bitter Lemons* also was scheduled for publication.

There were so many works of adult fiction—about 2,500 in all—published during the year that book reviewers despaired of reading even any considerable part of that number. Of necessity they had to concern themselves for the most part with those books called most vigorously to their attention by the publishers. This meant that some of the best novels received less attention than was their due.

High on any list of the year's best novels was *Madeleine Austrian* by Robert Kirsch. One of the very best novels ever written about Southern California it showed an aspect of that area unknown to most outsiders: a world of art and intellect. *Racers to the Sun* showed James B. Hall to be one of the most talented and one of the most consciously skillful writers of today. Madison Jones' *Forest of the Night* was a Conradian novel dramatizing man's necessity for accepting and learning to live with himself as a totality. George Bluestone's *The Private World of Cully Powers* was that rare and original thing, a serious novel comic in tone. Anthony West returned to the Victorians, in part, for his literary approach in his fine fictional tragedy, *The Trend Is Up*. Garet Rogers, a woman lawyer, wrote a brilliantly ironic novel that went back to the eighteenth century and Henry Fielding for her model—it was about a combative woman and was called *A Corner on Angels*. Except for Miss Rogers, these writers are all English professors or literary journalists in their thirties or early forties. It seems probable that these two groups are furnishing most of the best fiction writers now publishing.

Prominent among the works of fiction that the trade called the most "important"—that is, the most highly publicized—was *The Leopard*, a historical novel of Sicily written by a Sicilian nobleman, G. Lampedusa, and published after his death. *Set This House on Fire* was the long-awaited second novel of William Styron, which some reviewers called the best of recent years and others thought disappointing. *To Kill a Mockingbird* was a sensitive novel of childhood by Harper Lee. An excellent Southern writer, Elizabeth Spencer, published a fine short novel, *The Light in the Piazza*. But the event of the year in Southern fiction was the republication, after twenty-three years, of Allen Tate's *The Fathers*. One of the authentic American masterpieces, this fine novel of Virginia during the Civil War became available to a large new generation of readers.

Therefore Be Bold was the fifth novel of Herbert Gold, a writer with an impres-

TRAVEL AND ADVENTURE

A Zoo in My Luggage, Gerald Durrell; Viking.
Born Free, Joy Adamson; Pantheon.
A Time in Rome, Elizabeth Bowen; Knopf.
Surface at the Pole, Comdr. James Calvert, U.S.N.; McGraw-Hill.
No Room in the Ark, Alan Moorehead; Harper.
The Last Blue Mountain, Ralph Barker; Doubleday.

HISTORY

The Rise and Fall of the Third Reich, William L. Shirer; Simon and Schuster.
The Sky Suspended, Drew Middleton; Longmans, Green.
The World of Rome, Michael Grant; World.
Good-bye Dolly Gray, Rayne Kruger; Lippincott.

SCIENCE

The Firmament of Time, Loren Eiseley; Atheneum.
The Intelligent Man's Guide to Science, Isaac Asimov; Basic Books.
Journey into Summer, Edwin Way Teale; Dodd, Mead.
The Balance of Nature, Lorus J. and Margery Milne; Knopf.

GENERAL

Education and Moral Wisdom, George N. Shuster; Harper.
The Good Years, Walter Lord; Harper.
The Enemy Within, Robert F. Kennedy; Harper.
The Master Builders, Peter Blake; Knopf.
A Voice from the Attic, Robertson Davies; Knopf.
The Powers of Poetry, Gilbert Highet; Oxford.
Scotchman's Return, Hugh MacLennan; Scribner's.
Dictionary of American Slang, Harold Wentworth and Stuart Berg Flexner; Crowell.
Literature and Western Man, J. B. Priestley; Harper.
The Good Old Days: An Invitation to Memory, R. J. McGinnis; Harper.

ANTHOLOGIES, STORIES AND TALES

The Go-Away Bird, and Other Stories, Muriel Spark; Lippincott.
The Big It, A. B. Guthrie, Jr.; Houghton Mifflin.
Friday's Footprint, Nadine Gordimer; Viking.
Spring Song, Joyce Cary; Harper.
Stories from the New Yorker; Simon and Schuster.

FICTION

- *Ruan,* Bryher; Pantheon.
- *A Heritage and Its History,* I. Compton-Burnett; Simon and Schuster.
- *The Doomed Oasis,* Hammond Innes; Knopf.
- *Decision at Delphi,* Helen MacInnes; Harcourt, Brace.
- *Thrush Green,* "Miss Read"; Houghton Mifflin.
- *The Last of the Just,* André Schwarz-Bart; Atheneum.
- *The Affair,* C. P. Snow; Scribner's.
- *South of the Angels,* Jessamyn West; Harcourt, Brace.
- *The Dean's Watch,* Elizabeth Goudge; Coward-McCann.
- *The Christening Party,* Francis Steegmuller; Farrar, Straus and Cudahy.
- *The Householder,* R. Prawer Jhabvala; Norton.
- *A Night in Cold Harbor,* Margaret Kennedy; Macmillan.

MYSTERY

- *Cat among the Pigeons,* Agatha Christie; Dodd, Mead.
- *Watcher in the Shadows,* Geoffrey Household; Atlantic-Little, Brown.
- *Versus Inspector Maigret,* Georges Simenon; Doubleday.
- *Dead Men Don't Ski,* Patricia Moyes; Rinehart.
- *Passage of Arms,* Eric Ambler; Knopf.
- *The Traces of Brillhart,* Herbert Brean; Harper.
- *Too Many Clients,* Rex Stout; Viking.
- *A Party for the Shooting,* Louisa Revell; Macmillan.
- *A Mark of Displeasure,* Elizabeth Hely; Scribner's.

AUTOBIOGRAPHY AND BIOGRAPHY

- *Queen Mary, 1867–1953,* James Pope-Hennessy; Knopf.
- *Hollywood Rajah,* Bosley Crowther; Holt, Rinehart and Winston.
- *A Wayward Quest,* Theresa Helburn; Little, Brown.
- *Monsignor Ronald Knox,* Evelyn Waugh; Little, Brown.
- *You Learn by Living,* Eleanor Roosevelt; Harper.
- *The Edge of Day,* Laurie Lee; Morrow.
- *The Long Season,* Jim Brosnan; Harper.
- *Mark It and Strike It,* Steve Allen; Holt, Rinehart and Winston.
- *Now I Remember,* Thornton W. Burgess; Little, Brown.
- *That Great Lucifer,* Margaret Irwin; Harcourt, Brace.

sive critical following. *The Child Buyer* was not, in the opinion of most reviewers, one of John Hersey's best books. Taylor Caldwell's *The Listener* was an earnest attempt by one of America's most popular novelists to state the human need for understanding. James Purdy produced *The Nephew,* which was well liked by the critics. C. Y. Lee, author of *The Flower Drum Song,* published another well-received Oriental novel, *Madame Goldenflower. All Fall Down* was the first novel of dramatist (*Blue Denim*) James Herlihy. *The Hands of Cormac Joyce,* a story of Irish seafarers by Leonard Wibberly, was highly praised by a band of admirers who insisted that it was an unrecognized masterpiece.

The most controversial novel of the year may well have been *The Chapman Report,* by Irving Wallace. This was a fictional treatment of the impact of a Kinsey-like study on the habits of several matrons in an upper-income Los Angeles suburb. *The View from the Fortieth Floor* was a novel about the magazine-publishing world and was written by Theodore White, who has worked on several fashionable magazines. The talented Jerome Weidman brought out *Before You Go.*

Wright Morris' *Ceremony in Lone Tree* picked up the characters of his National Book Award-winning *The Field of Vision,* published ten years ago. Jack Kerouac, symbol of the beat generation, added *Tristessa* to his mounting list of books. Pierre Sichel told the story of a Dylan Thomas-like poet in *The Sapbucket Genius.* Ovid Williams Pierce, a talented Southern writer, was the author of *On a Lonesome Porch.* Some literary westerns were *Carrington,* by Michael Straight, *A Distant Trumpet,* by Paul Horgan, and *Welcome to Hard Times,* by E. L. Doctorow.

The world of the ancients was revived in Rex Warner's *Imperial Caesar* and N. Kazantzakis' *The Last Temptation of Christ. Venetian Red* was the first novel of the noted Italian scholar P. M. Pasinetti, now teaching at the University of California at Los Angeles. Another foreign novelist who attracted great attention was Agnar Mykle, with *Lasso Round the Moon.* Alain Robbe-Grillet, the current darling of French fiction, with his "surface-of-things" technique, saw his *In the Labyrinth* translated into English. Robbe-Grillet's fiction approach was judged to have much in common with the serious cinema, as was that of Nathalie Sarraute whose *The Planetarium* had much in common with Robbe-Grillet's work. Swiss writer F. Duerrenmatt's *Traps* was published in the United States.

Hilda Doolittle, the imagist poet, produced her first novel, *Bid Me to Live,* and a young American short-story writer, Richard Stern, wrote a satire of mass communications in *Golk.*

Good war novels continued to come: Glen Sire's *The Deathmakers,* Richard Matheson's *The Beardless Warriors* and David MacCuish's *Do Not Go Gentle* were among the best. Flannery O'Connor, better known as a short-story writer than as a novelist, published her second novel, *The Violent Bear It Away.* John O'Hara utilized new (for him) technical approaches in *Ourselves to Know,* an examination after-the-fact of a murder and a murderer. Robert Nathan's *The Color of Evening* showed his usual fine imagery. Frederic Morton's *The Witching Ship* was both strenuously praised and condemned. John Leggett's *Wilder Stone* was probably as much discussed as any first novel. Harvey Swados was the author of *False Coin.* Françoise Sagan's *Aimez-vous Brahms?* was by and large considered competent and no more.

Harry Brown's *The Stars in Their Course* was a western-style retelling of the Trojan War. Few saw, however, that Irwin Shaw made use of the Faust myth in his greatly underrated *Two Weeks in Another Town,* and almost nobody seemed to realize that Robert V. Williams went to *Hamlet* for his story in his prize-fight corruption novel, *Shake This Town.*

The year 1961 is the centennial of the beginning of the war between the states, but books about that conflict have been flowing in such a heavy stream for several years that any increase is difficult to note. One of the most exciting picture-text books ever published on the old South was Harnett Kane's *Gone Are the Days. Grant Moves South* was another of Bruce Catton's notable studies of the conflict. *The Tragic Years* was one of the most unusual histories of the Civil War in some time. Edited by Paul M. Angle and Earl Schenck Miers, it was a narrative made up of letters, newspaper stories, diaries, official documents and other source material.

This has been called a critical age and books about books achieved a popularity in 1960 that went well beyond professional literary circles. A very scholarly and at the same time readable, critical book was William York Tindall's *A Reader's Guide to James Joyce.* One of the most discussed books of the year was Leslie Fiedler's *Love and Death in the American Novel.* Albert van Nostrand's *The Denatured Novel,* a documented charge that the novel has been weakened by external pressures on the novelist, was discussed almost as thoroughly, particularly in publishing circles. S. N. Behrman's *Portrait of Max* was an affectionate study of the urbane essayist Max Beerbohm. *Thomas Wolfe* was a biography of the controversial novelist by his agent Elizabeth Nowell. Many other excellent critical works were published, among them Robert W. Stallman's *The Art of Joseph Conrad,* Albert Cook's *The Meaning of Fiction* and John Cruickshank's *Albert Camus and the Literature of Revolt.* David Daiches retold the story of English literature in an urbane and perceptive two-volume work, *A Critical History of English Literature.*

The larger American audience remained, unfortunately, indifferent to most volumes of poetry, but those committed to this form of writing remained dedicated. Among the better-known poets publishing volumes during the year were Robert Penn Warren, W. H. Auden and Daniel Hoffman.

All in all, the year—like most other years in publishing—was marked by a high average of quality and only a very, very few books that might someday be called great.

The CIVIL WAR in Books

By EARL SCHENCK MIERS

Author

IN 1861 the United States was torn asunder by civil war. The most astonishing result of this "brothers' quarrel" is not the bitterness with which it was fought but the fact that today, a hundred years later, neither its spiritual nor political wounds have entirely healed. Instead of abating, interest in all phases of the war seems to be increasing as more and better books on the subject are published or reprinted.

It is difficult to say why this theme continues to captivate readers. Old passions still smolder in the thousands of pages about the war that are published year after year. Old battles of mind and heart continue to be fought. History and folk tale, sectional pride and prejudice, family tradition and political expediency remain so intermingled that the viewpoint of individual authors endures as a prime factor in critical judgment of any Civil War book.

From the vantage point of nearly a century after the conflict, writers are choosing subjects and personalities varied enough to offer attractive fare for almost any reader interested in the period. Biographies published within the past few years range from lives of generals and admirals to those of army privates of both the Union and the Confederacy. There are books based on diaries of fighting men, studies of the causes of the Civil War, books on hospitals, medical and sanitary services, financial aspects of the conflict and accounts of women of the North and South. Some are very valuable contributions to the world's knowledge of the period, the war and the leading personalities on both sides; others are interesting mainly because they fill in small gaps, like pieces in a jigsaw puzzle.

Through the years, schools of historical interpretation have emerged. The most influential of these, currently, is that of Lincoln as the dominant figure in the era, and stems from the publication in 1953 of the nine volumes of *The Collected Works of Abraham Lincoln*, under the editorship of Roy P. Basler. This monumental work portrays President Lincoln as the leading spokesman of an age to which a wide variety of heroes belonged: Melville and Whitman among its intellectuals, Lee and Grant among the reluctant warriors.

A second important work, sponsored by the Lincoln Sesquicentennial Commission set up by Congress, is *Lincoln Day by Day* in three volumes. Published in 1960, it was compiled by William E. Baringer and C. Percy Powell. For at least a generation, and more likely for a hundred years, the phrase "according to Baringer" or "according to Powell" will be a standard reference for those seeking to explain Lincoln and his age. This richly detailed study gives telling insight into the mind and character of Lincoln as an accomplished lawyer who, over a lifetime, remained a staunch advocate and a formidable adversary. His strength rested in the causes and principles to which he committed his mind and heart, and the Lincoln who reached the White House was no country bumpkin, but a man well-schooled in human relations.

Basically, it is the Civil War in this dimension—with Lincoln as the dominant figure—to which Allan Nevins addresses himself in the four volumes of *The War for the Union*, a work that must stand as a triumph of historical writing. In *The Improvised War*, published in 1959 as the first volume of the group, Professor Nevins is involved with the theme of history in the grand manner. The new books are a continuation of his previous works, each in two volumes, *The Emergence of Lincoln* and *The Ordeal of the Union.*

Bruce Catton revealed a combination of literary brilliance and faithful scholarship in *This Hallowed Ground,* 1956 Book-of-the-Month Club winner, which was frankly subtitled, "The Story of the Union Side of the Civil War." Another of his works, *Grant Moves South,* was published in 1960 and quickly moved onto the best-seller lists. In completing this definitive biography of Grant started by the late Lloyd Lewis, Mr. Catton avoided the hazard inevitable in such enterprises; as a historian he has remained true both to himself and to Mr. Lewis. To wed the spirit of one author to the ability of another is the achievement of a master. Mr. Catton deserves his kudos.

Mr. Catton's book, however, in no sense cancels the remarkable work of the late Kenneth P. Williams, Indiana mathematician-turned-historian, who studied Grant's military development as carefully as though teaching himself the theory of equations. Published posthumously in 1959, the fifth volume of Professor Williams' *Lincoln Finds a General* carried Grant's story through the battle of Chickamauga. Professor Williams understood and could use official records with rare patience and skill. In his five volumes, from Grant's opening gambit at Ironton, Missouri, in 1861, to the middle Tennessee campaigns of late 1863, he plotted the moves and countermoves by which Grant emerged to stand with Lincoln as an architect of survival for the Union.

Against this onslaught in behalf of the Union, historians in the South have been far from idle. In the front rank of these stands Hudson Strode, who in 1959 published the second volume in his detailed biography of Jefferson Davis, carrying the story of the Confederate President through the critical years from 1861 to 1864. Northerners who read *Jefferson Davis: Confederate President* may feel pangs of discomfiture, as they do when reading Jefferson Davis' own *The Rise and Fall of the Confederate Government* (recently reprinted).

The United States, a big, loose country from 1861 to 1865, fought a big, loose war. Among recent studies are many that have brought fresh insight into this many-sided conflict. *Vicksburg: A People at War, 1860–1865* by Peter F. Walker is an absorbing story of how a city out-of-sympathy with the Confederacy was made to conform. *The Military Legacy of the Civil War: The European Inheritance* by Jay Luvaas is the first of three volumes intended to show how much the American citizen-at-war taught the rest of the world. *The Civil War in the Western Territories: Arizona, Colorado, New Mexico and Utah* is Ray C. Colton's study of how the ambitions of the Confederacy failed west of the Rio Grande. *Thaddeus Stevens: Scourge of the South* by Fawn M. Brodie is an objective study of an arch-radical among the Republicans; and *High Tide at Gettysburg* by Glenn Tucker, an excellent retelling of the events behind the war's most celebrated battle.

Rare are the attics or archives that have not been searched in recent months for war letters and diaries. Collections such as *From the Cannon's Mouth: The Civil War Letters of General Alpheus S. Williams,* edited by Milo M. Quaife, and *Three Years in the Army of the Cumberland* by James A. Connolly and edited by Paul M. Angle, are important sources for all students of the war. Confederate collections have been refreshingly candid and unsentimentalized. Of great significance in understanding how and why the Southern soldier endured those tragic years are *Reluctant Rebel: The Secret Diary of Robert Patrick, 1861–1865,* edited by F. Jay Taylor; *A Life for the Confederacy, as recorded in the Pocket Diaries of Robert A. Moore,* edited by James W. Silver; and *This Infernal War: Confederate Letters of Sgt. Edwin H. Fay,* edited by Bell Irvin Wiley.

Book dealers have been flooded not only with new books about the Civil War but also with reprints of works that were no longer on the market. Reprints of the rare and near-rare, the important and the trivial have come from the presses as though this river of print would never run dry. These range from works in many volumes, such as *Battles and Leaders of the Civil War* and Frederick H. Dyer's *A Compendium of the War of the Rebellion* to *The Confederate Soldier in the Civil War*, a compilation of pictures and text assembled by the Louisville (Kentucky) *Journal* shortly after the war ended.

One of the most important and most comprehensive new Civil War reference books is *The Civil War Dictionary*, compiled by Lt. Col. Mark M. Boatner III. A volume of nearly 1,000 pages, it contains maps and diagrams by Allen C. Northrop and Lowell I. Miller as well as more than 4,000 entries and approximately 2,000 short biographies. Liberally cross-referenced, the new dictionary also defines technical military terms. Another important new reference work for the Civil War zealot is *Generals in Gray: Lives of the Confederate Generals* by Ezra J. Warner. It includes photographs of all but one of the Southern generals.

Counting pamphlets and reprints as well as books about Abraham Lincoln and about the war, Mr. Ralph G. Newman, founder of the Civil War Book Club. has estimated that an average of a title a day has been published since the Confederates fired on Fort Sumter. The pace has not abated.

A SELECTED LIST OF RECENT CIVIL WAR BOOKS

The Collected Works of Abraham Lincoln, edited by Roy P. Basler, assisted by Marion Dolores Pratt and Lloyd A. Dunlap; Rutgers University Press.
The Civil War Dictionary, Mark M. Boatner; McKay.
Lincoln and the Tools of War, Robert V. Bruce; Bobbs-Merrill.
Grant Moves South, Bruce Catton; Little, Brown.
This Hallowed Ground: The Story of the Union Side of the Civil War, Bruce Catton; Doubleday.
The Civil War in the Western Territories, Ray C. Colton; University of Oklahoma Press.
Kate: The Journal of a Confederate Nurse, Kate Cumming, edited by Richard Barksdale Harwell; Louisiana State University Press.
To Appomattox: Nine April Days, 1865, Burke Davis; Rinehart.
This Infernal War: The Confederate Letters of Sgt. Edwin H. Fay, edited by Bell Irvin Wiley, assisted by Lucy E. Fay; University of Texas Press.
The Military Legacy of the Civil War: Volume I, The European Inheritance, Jay Luvaas; University of Chicago Press.
The Great Rebellion: The Emergence of the American Conscience, Earl Schenck Miers; World Publishing.
Lincoln Day by Day: A Chronology, 1809–1865, edited by Earl Schenck Miers, assisted by William E. Baringer and C. Percy Powell; Lincoln Sesquicentennial Commission.
Grape and Canister: The Story of the Field Artillery of the Army of the Potomac, L. Van Loan Naisawald; Oxford.
The War for the Union, Allan Nevins; Scribner's.
The Twentieth Maine: A Volunteer Regiment in the Civil War, John J. Pullen; Lippincott.
From Cedar Mountain to Antietam, August–September, 1862, Edward J. Stackpole; Stackpole Company.
Jefferson Davis, American Patriot, Hudson Strode; Harcourt Brace.
Jefferson Davis, Confederate President, Hudson Strode; Harcourt Brace.
High Tide at Gettysburg, Glenn Tucker; Bobbs-Merrill.
Vicksburg: A People at War, 1860–1865, Peter F. Walker; University of North Carolina Press.
Generals in Gray: Lives of the Confederate Commanders, Ezra J. Warner; Louisiana State University Press.
They Who Fought Here, Bell Irvin Wiley and Hirst D. Milhollen; Macmillan.
Lincoln Finds a General: A Military Study of the Civil War, Kenneth P. Williams; Macmillan.
The Long Arm of Lee: The History of the Artillery of the Army of North Virginia, Jennings Cooper Wise; Oxford.
The Women and the Crisis: Women of the North in the Civil War, Agatha Young; McDowell, Obolensky.

Music in 1960

By RAYMOND ERICSON
Music Department
THE NEW YORK TIMES

THE saying that "art unites while politics divides" was proved true during two diplomatic crises in 1960. More than 50,000 Japanese people cheered the Boston Symphony Orchestra in its twenty-two concerts in Japan in the spring, shortly before the anti-Eisenhower demonstrations in Tokyo. The U-2 incident in Soviet Russia did not detract from the successful return of two American artists to Soviet Russia—Van Cliburn, pianist, and Isaac Stern, violinist.

The Boston Symphony's tour of the Far East marked the initial appearance of an American orchestra in Australia. In a late-summer tour, the New York Philharmonic was heard in such distant points as West Berlin, Honolulu and Vancouver, British Columbia. No mainland symphony orchestra had previously visited Hawaii.

Stanislaw Skrowaczewski, Polish conductor, replaced Antal Dorati as musical director of the Minneapolis Symphony Orchestra. It was announced that Georg Solti would take over the Los Angeles Philharmonic in the 1961–62 season. Eugen Jochum and Bernard Haitink were named co-conductors of the famous Concertgebouw Orchestra in Amsterdam.

The International Society for Contemporary Music held its thirty-fourth festival in Cologne, Germany. Some forty new works were presented, together with other programs and operatic performances, between June 10 and 19. Emphasis was placed on works of radical tendencies, particularly electronic music.

Three American works, not electronic, were given: Roger Sessions' Symphony No. 4, Gunther Schuller's *Spectra* for orchestra, and Arthur Berger's String Quartet 1958. Other compositions played included *Contacts* for electronic sounds, piano and percussion, by Karlheinz Stockhausen (Germany); *Selektion I* for four groups of loudspeakers, by Herbert Eimert (Germany); *Canti di Liberazione* for chorus and orchestra, by Luigi Dallapiccola (Italy); *Aprèslude* for orchestra, by Niccolo Castiglioni (Italy); *Requiem* for chorus and orchestra, by Boris Blacher (Germany).

Gatherings of composers to listen, learn or lecture seemed especially frequent in the summer of 1960. Composers from countries behind the iron curtain met with those from the West in Dubrovnik, Yugoslavia. Avant-garde composers held their annual sessions in Darmstadt and Donaueschingen, Germany. Soviet composers joined colleagues from the West in Stratford, Ontario, Canada. Young American composers met in Bennington, Vermont, and attended the second annual seminar at Princeton University.

G. Schirmer, leading American music publisher, celebrated its hundredth anniversary by commissioning works from Samuel Barber (Piano Concerto), Easley

NEW YORK PHILHARMONIC

Symphonic music in a tropical setting: Leonard Bernstein conducts the New York Philharmonic in the Waikiki Shell in Honolulu, Hawaii.

Blackwood (Symphony No. 2) and Alec Wilder (opera). Broadcast Music, Inc., a music-licensing organization, celebrated its twentieth anniversary by awarding $40,000 in commissions to several American composers.

The Columbia Broadcasting System commissioned a television ballet from Igor Stravinsky and a play with music from Gian Carlo Menotti. The Philadelphia Orchestra announced a $5,000 commission to composer Walter Piston, the first in an annual project.

Ford Foundation grants were extended. Twelve more fellowships were given to young American composers to serve in high-school systems during the school year. Through the American Music Center, the foundation commissioned works for regional orchestras from John Boda, Wayne Peterson, John Pozdro, Bernard Rogers, Charles Cushing and Douglas Allanbrook.

Elliott Carter won the 1960 Pulitzer Prize in music for his String Quartet No. 2. The New York Music Critics Circle made the following awards for the best new works performed in New York City during 1959: to Norman Dello Joio for his opera *The Triumph of St. Joan*, to Paul Hindemith for his *Six Madrigals* for a cappella chorus and to Leon Kirchner for his String Quartet No. 2.

The important Queen Elisabeth of Belgium International Piano Competition, held in Brussels, was won by an American, Malcolm Frager. He also had won the major Leventritt competition for pianists in New York City the previous fall. Seven of the twelve prizes given in the Brussels event were taken by North Americans. Maurizio Pollini, eighteen-year-old pianist of Italy, won the sixth International Chopin Prize at Warsaw.

The Naumburg Foundation in New York established a biennial contest with the largest prize available to American participants. This includes $5,000, a two-year contract with a concert management, European and American tours, an appearance as soloist with the New York Philharmonic, a solo recital in New York and a recording contract with Columbia Records. The initial contest, for string players, was held in the fall. It was won by Joseph Silverstein, violinist.

First prize in a newly instituted Franz Liszt Piano Competition, held in New York, was won by Ivan Davis. The National Symphony Merriweather Post Award, held in Washington, D.C., in the spring, gave two first prizes in 1960: to David A. Brown, seventeen-year-old pianist of Salt Lake City; and Lynn Harrell, sixteen-year-old cellist of Dallas.

The Metropolitan Opera Auditions were won by Mary MacKenzie, mezzo-soprano.

The Metropolitan Opera Association opened its 1960-61 season with its first production of Verdi's early opera *Na-*

bucco. Other new productions promised were of Donizetti's *L'Elisir d'Amore,* Puccini's *Turandot,* Gluck's *Alcestis* and Flotow's *Martha.* Dimitri Shostakovich's orchestration of Musorgski's *Boris Godunov* was used for the first time by the Metropolitan in its revival of the work.

In February the New York City Opera gave the first full-stage performance of Marc Blitzstein's *The Cradle Will Rock.* With a grant from the Ford Foundation, the company made a five-week tour of nineteen cities in late winter, presenting a repertory of American opera. The company's fall season in New York included a double bill of Monteverdi's *Orfeo* and Luigi Dallapiccola's *The Prisoner;* the American *première* of Werner Egk's *The Inspector General,* conducted by the composer; and Gilbert and Sullivan's *The Pirates of Penzance,* besides other works.

The San Francisco Opera announced the West Coast *première* of Alban Berg's *Wozzeck* as part of its 1960 fall season.

The Royal Opera, Covent Garden, in London, engaged Georg Solti as director; Mr. Solti will spend three months each season with the Los Angeles Philharmonic. La Scala in Milan gave among other works its first performances of Ernest Bloch's *Macbeth* and Berlioz's *The Trojans.* The major new work on German stages was Hans Werner Henze's *Der Prinz von Homburg,* given by the State Opera of Hamburg. The Comic Opera in East Berlin produced *The Good Soldier Schweik,* composed by the late Robert Kurka, an American.

On television, the National Broadcasting Company Opera put on Mozart's *Don Giovanni* on April 10 in a new English version by W. H. Auden and Chester Kallman. NBC's 1960–61 season was to begin at the end of the year with the *première* of Leonard Kastle's *Brigham Young.* The Hallmark Hall of Fame program announced for December 16 a ninety-minute opera, Philip Bezanson's *The Golden Circle.* The British Broadcasting Corporation offered a television opera it had commissioned, Sir Arthur Bliss' *Tobias and the Angel.*

The Third International Festival at Osaka, Japan, honored the centennial of Japanese-American relations. It included the production of Koscak Yamada's *Black Ships,* an opera based on the visit of the American Navy that ended in a treaty opening Japan to the West.

The 43rd biennial Cincinnati May Music Festival, devoted largely to choral works, offered only one new one, Margaret Johnson Bosworth's *Queen City Suite,* for children's chorus and orchestra. The 67th Annual May Festival at the University of Michigan, Ann Arbor, included the *première* of Ross Lee Finney's Symphony No. 2.

Spring festivals of contemporary arts, becoming increasingly popular in colleges and universities, scheduled many *premières.* Two notable ones were Virgil Thomson's *Requiem,* given at the State University College of Education, Potsdam, New York, and Carlisle Floyd's *Pilgrimage,* a solo cantata given at Syracuse University, Syracuse, New York.

Among summer events in the United

A new opera, *The Prisoner,* was on the bill opening the New York City Opera season.

NEW YORK CITY OPERA

Donizetti's *L'Elisir d'Amore* was given a fresh production by the Metropolitan in 1960–61.

METROPOLITAN OPERA ASSOCIATION

States the Empire State Festival, outside of New York City, produced two rarely heard operas, Deems Taylor's *Peter Ibbetson* and Leos Janacek's *Katya Kabanova.* An ambitious season by the Cincinnati Summer Opera included Verdi's *Macbeth,* Bellini's *La Sonnambula,* Benjamin Britten's *Peter Grimes,* Richard Strauss' *Salome* and five other works. The Central City (Colorado) Opera Festival was devoted to Verdi's *Aïda* and Donizetti's *Lucia di Lammermoor.* A repertory of eight works at Santa Fe, New Mexico, ranged from Gilbert and Sullivan's *The Gondoliers* to Stravinsky's *The Rake's Progress.*

The summer orchestral concerts at Lewisohn Stadium in New York City included a Beethoven cycle led by Josef Krips. The Ravinia Festival, outside of Chicago, observed its twenty-fifth anniversary. Constantin Silvestri, Romanian conductor, made his American debut in this series. The Robin Hood Dell in Philadelphia drew its largest crowd to date, 31,000, when Leopold Stokowski conducted there for the first time in twenty-seven years. Novelties at the Berkshire Festival at Tanglewood, Massachusetts, were limited to chamber works and a short opera, *Port Town,* by Jan Meyerowitz. Pablo Casals, cellist, was a visiting teacher and artist at the ten-year-old Marlboro, Vermont, Festival, conducted by Rudolf Serkin, pianist. The music of Aaron Copland and Beethoven was stressed at the Aspen, Colorado, festival. The season at Hollywood Bowl in California was the longest in its history. Among the thirty-five events was the reappearance of Jascha Heifetz, violinist, after a couple of seasons away from the concert platform.

The opening of the new Festspielhaus at Salzburg, Austria, inaugurated the 1960 festival there on July 26. *Le Mystère de la Nativité,* by the Swiss composer Frank Martin, had its first stage performance.

The new productions at Glyndebourne, England, were Bellini's *I Puritani* and Mozart's *Don Giovanni.* At Aldeburgh, England, Benjamin Britten's latest opera, *A Midsummer Night's Dream,* had its *première.*

The May Festival at Florence, Italy, revived Jacopo Peri's *Euridice,* the earliest opera for which the music has survived, and Cherubini's *Elisa.* Also presented were three short operas in *premières:* Roberto Lupi's *La Danza di Salome,* Luciano Chailly's *Il Mantello* and Valentino Bucchi's *Una Notte in Paradiso.* A special feature of the festival was the appearance in a local church of the New York Pro Musica in its production of *The Play of Daniel,* a medieval mystery play. This production was seen in other churches throughout Europe during the summer.

The *première* of Igor Stravinsky's *Monumentum Pro Gesualdo di Vicenza* was an event at the Venice Festival.

Henk Bading's opera *Martin Korda, D.P.* was given for the first time on the opening night of the Holland Festival in Amsterdam. Another operatic *première,* Boris Blacher's *Rosamunde Floris,* was part of the Berlin Festival.

WIDE WORLD

Polish conductor Stanislaw Skrowaczewski, new director of the Minneapolis Symphony.

Mezzo-soprano Mary MacKenzie, Metropolitan Opera Auditions winner.

COLUMBIA RECORDS

REVIEW OF RECORDS, 1960

By JULIAN SEAMAN

Music Editor and Critic

RECORDINGS of the spoken word—entire plays, poems, dramatic readings and so on—have been having a definite vogue. Among those that appeared in 1960 were the Vanguard albums of Germaine Montero, *Canciones de Espana* (VRS 9050) and *Lament on the Death of a Bullfighter* (VRS 9055); two parts of the *Jupiter Anthology of Modern Verse,* read by Jal Balcon (JUR 00A1–00A2); Nathaniel Hawthorne's *The Minister's Black Veil* and *Young Goodman Brown,* read by Basil Rathbone (Caedmon TC-1120); *The Poems of Emily Dickinson,* read by Nancy Wickwire, with original music composed by Don Feldman (Spoken Arts 761); and *Daphnis and Chloë* by Longus, a Greek writer of the second and third centuries A.D., with Moses Hadas reading his own introduction and translation (Folkways FL 9980).

Straddling the fence of music and the spoken word is Columbia's documentary *The Revolution* (Set LL 1001—Stereo Set LS 1002), produced by Goddard Lieberson with the National Gallery Orchestra conducted by Richard Bales, the Cantata Choir of the Lutheran Church of the Reformation, Peggy Zabawa, soprano, and Jule Zabawa, baritone. The musical part of this recording is "a cantata based on music of the American colonies during the years 1775–1800."

Still in the category of the spoken word is *The Best of Sellers* (Angel 35884), an entirely hilarious interlude by that master of mad satire Peter Sellers.

The Deutsche Grammophon Gesselschaft (records imported by Decca) has shown what perfect recording and sound can do for a musical masterpiece in excerpts from *Tristan and Isolde* (136030). Ferdinand Leitner conducts the Bamberg Symphony Orchestra, aided by Astrid Varnay, Wolfgang Windgassen and Hertha Töpper. A superb performance of the Dvorak *Requiem*—Opus 89—(SLPM 138026/27) has also been recorded by Grammophon; it is sung by Maria Stader, Sieglinde Wagner, Ernst Haefliger and

At a recording session (left), conductor Leonard Bernstein and violinist Isaac Stern concentrate on Alban Berg's Violin Concerto.

Glenn Gould (below) at work on recording J. S. Bach's "Italian" Concerto.

COLUMBIA RECORDS

PUBLIFOTO. ANGEL RECORDS

Rossi-Lemeni, Callas, Cavallari and Filippeschi record the La Scala production of *Norma*.

Kim Borg. Karel Ancerl conducts the Prague Philharmonic Orchestra.

On the lighter side are two extraordinary albums, Grammophon's *Der Freischütz* (LPM 18639/40) and Angel's *Die Fledermaus* (3581 B/L). Both must be praised for splendid singing, recording and felicitous performance. Among Grammophon's momentous efforts is the Mozart *Great Mass,* in C minor (K. 427) (LPM 18624), a magnificent performance beautifully recorded. Ferenc Fricsay conducts the Berlin Radio Symphony Orchestra, with Maria Stader, Hertha Töpper, Ernst Haefliger, Ivan Sardi and the choir of St. Hedwig Cathedral.

The standard repertoire of tried masterpieces as usual dominated among the recordings of the year. Among the more notable examples were London's series of five Beethoven piano concertos (CSA-2401) performed by the veteran German pianist Wilhelm Backhaus. Glenn Gould, Canadian pianist, gives an exceptional performance of three Bach pieces (Col. ML 5472). One must applaud heartily the Columbia album of Beethoven string quartets recorded by the Budapest String Quartet (ML 4577–78). This album contains the quartets in D, C minor, A major and B flat (Opus 18, Nos. 3, 4, 5 and 6).

Wolfgang Sawallisch seems to be emerging as one of the finer conductors of the day. He is represented brilliantly with the Philharmonia Orchestra and Dennis Brain, horn, in the two Strauss concertos for horn and orchestra, No. 1 in E flat and No. 2 in the same key. Both are recorded by Angel (3496).

Herbert von Karajan and the Berlin Philharmonic Orchestra have come forth with a blazing account of some Brahms Hungarian and Dvorak Slavonic dances (138080). No attempt is made at a complete statement in either category, yet the whole is a joyous interlude, transmitted with all the resonance and veracity of Deutsche Grammophon. Excellent also is Angel's *Rhapsodies for Orchestra* (35677) with Constantin Silvestri conducting the Vienna Philharmonic in Ravel, Enesco and Liszt. Sir Thomas Beecham conducts the Royal Philharmonic, also for Angel (35458), in Sibelius' *The Oceanides*, Symphony No. 7, in C (Opus 105), and the incidental music to *Pelléas et Mélisande* (Opus 46).

One is not inclined to associate the ironic Prokofiev with the carefree waltz, yet his *Waltzes* (Opus 110) was issued toward the end of the year by Urania (UX-130), performed somewhat heavily by Hans Schwieger and the Kansas City Philharmonic Orchestra. This album also contains *Gypsy Fantasy* (Opus 127) from the ballet score of *A Tale of the Stone Flower*. Leopold Stokowski, at his former post on the Philadelphia Orchestra podium, made recordings of the Falla *El Amor Brujo* and the love music from Acts 2 and 3 of *Tristan*, Columbia album (ML 5479). London issued a first-rate recording (CM 9247) of the Mozart clarinet concerto in A (K. 622) and the two horn concertos, No. 1 in D (K. 412) and No. 3 in E flat (K. 447). Gervase de Peyer is the clarinetist, Harry Tuckwell the solo horn, with Peter Maag conducting the London Symphony Orchestra. Columbia issued a cluster of Berlioz overtures (*King Lear, Le Corsaire, Les Francs-Juges, Waverley*), a sprightly fanfare by the Royal Philharmonic conducted by Sir Thomas Beecham (ML 5064).

There have been many arresting performances of the Brahms First Symphony (Opus 68, C minor). Probably none has been more wholly satisfying than Grammophon's album issued last autumn (LPM 18613), recorded by the Berlin Philharmonic under the guidance of Karl Böhm. The ease, fluency and lambent tone, the unhurried drama and inherent zest of this performance will remain in the musical memory for a long time.

Vanguard has put out a performance of the Mendelssohn violin concerto by Mischa Elman, with the Lalo *Symphonie Espagnole* as a fillout (Van. 1050). Vladimir Golschmann conducts the Vienna State Opera Orchestra. Neither the orchestra nor Mr. Elman is in the best form. Yet the recording is worth hearing for the sound alone and also because the intermezzo of the Lalo piece, too often omitted in concert performance, has been restored.

One of the more memorable contributions of Deutsche Grammophon is the performance of two Beethoven symphonies (No. 1, in C, Opus 21; No. 8, in F, Opus 93), with Eugen Jochum conducting the Berlin Philharmonic Orchestra (12025). These readings are subtle and infinitely flexible and perceptive and should stand among the achievements of truly great conductors everywhere.

COLUMBIA RECORDS

The tunes of a successful musical, *Bye Bye Birdie*, are given permanent form by the original cast.

Decca's volume of *Elizabethan and Jacobean Ayres, Madrigals and Dances* for voices and viols (DL 9406) is a treasure. It includes snatches of Gibbons, Morley, Dowland, Campion, Coperario, Jones and Farmer, recorded by Noah Greenberg and the New York Pro Musica Antiqua. Capitol has recorded the complete Bach Brandenburg Concertos with Yehudi Menuhin as conductor-soloist, with the Bath Festival Chamber Orchestra. Robert Masters conducts two of the concertos (GBR 7217).

Devotees of Bach will find cheer and satisfaction in Epic's account of the Cantata No. 169 (*Gott soll allein mein Herze Haben*) (LC 3683). The soloists are Aafje Heynis, contralto, and Albert de Klerk, organist, with Anthon van der Horst conducting the chorus of the Netherlands Bach Society and the Netherlands Chamber Orchestra. A cantata by C. Ritter (*O Amantissime Sponse Jesu*) fills out the other side.

Another masterpiece is Columbia's recording of the Debussy *Le Martyre de St. Sébastien* (M2L 266), in which Vera Zorina is the narrator, with Hilde Gueden, soprano, the Philadelphia Orchestra and Chorus and the Musical Art Society of Camden. Eugene Ormandy conducts.

Worthy of more than passing remark is Angel's edition of the Walton *Belshazzar's Feast* (35681), with the composer conducting the Philharmonia Orchestra and Chorus, and Donald Bell as baritone soloist. The Capitol issue of the Verdi Requiem ("Manzoni" Requiem) (7227), conducted by Tullio Serafin, with the orchestra and chorus of the Rome Opera House, has much to commend it. Its virtues are choral and orchestral, for the soloists, despite some eminent names, do not quite fill the bill.

Victor has issued very little during the year, but high on its roster of distinctive discs is the Prokofiev cantata *Alexander Nevsky* (Opus 78) (LM 2395). Despite some uneven singing and a mediocre English translation, Fritz Reiner and the Chicago Symphony Orchestra manage to convey the cantata's dramatic mood with enormous intensity.

Westminster, pursuing its Project Scarlatti with a spate of sonatas, is still short of its intended goal of the complete catalogue. Fernando Valenti again is the harpsichord soloist (XWN 18772–18785–18814–18826–18868, 14079–18918). Of the 555 harpsichord sonatas by Domenico Scarlatti, Westminster now has recorded 299.

Vox has issued Bach's complete *Brandenburg Concerti*, the Violin Concertos Nos. 1 and 2, and the Concerto for Two Violins in D minor (VBX 25). From Vox also comes Volume 1 of the complete Handel organ concertos, with Walter Kraft as organist and the Stuttgart Pro Musica Orchestra, conducted by Rolf Reinhardt (VBX 23).

In the field of opera a new *Traviata* was issued by Capitol (GCR 7221) with Tullio Serafin conducting, and Victoria de los Angeles, Carlo del Monte and the orchestra and chorus of the Rome Opera House. A "rehearsal" record goes with this one. The Angel recording of Ponchielli's *La Gioconda* (C/L 3606), with Maria Callas, Pier Miranda Ferraro and Fiorenza Cossotto, and Antonio Votto conducting, is only soso from every angle. One may say much the same thing of *Manon Lescaut*, released by Angel in January 1960 (3564 C/L). Angel's new *Don Giovanni* (3605 D/L), on the other hand, is a splendid album for both recording and performance. It presents a remarkable baritone, Eberhard Wächter, as the errant Don; Elisabeth Schwarzkopf as Elvira; Joan Sutherland as Anna; Luigi Alva as Don Ottavio; and Giuseppe Taddei as Leporello; with the Philharmonia Orchestra and Chorus conducted by Carlo Maria Giulini.

Angel's new edition of Mahler's *Das Lied von der Erde* (3607 B) substitutes a baritone, Dietrich Fischer-Dieskau, for the usual mezzo-soprano or contralto. Musically the substitution is unfortunate, for the male voice, even the formidable one of Mr. Fischer-Dieskau, carries nothing of the poignant grief and pathos expressed in the text.

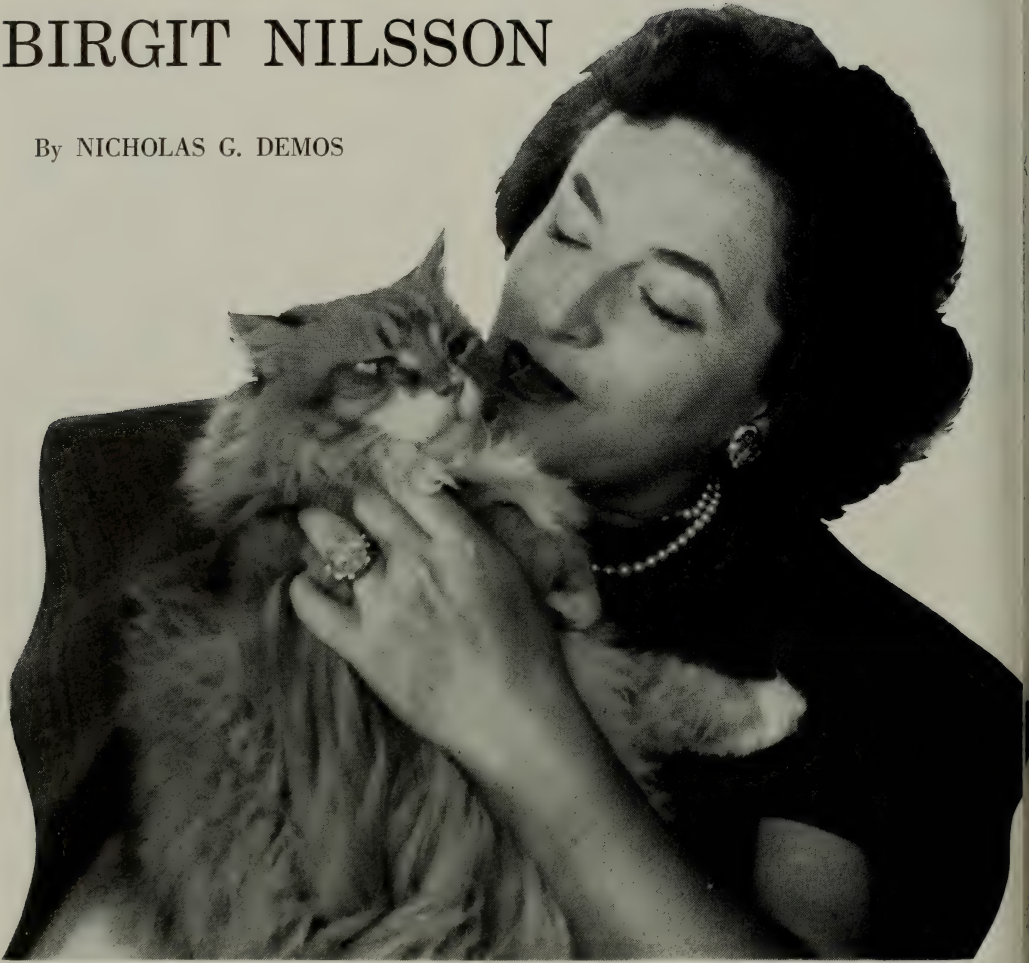
Two albums of orchestral interest came from Columbia. Bruno Walter conducts the Columbia Symphony Orchestra in the gigantic Bruckner Ninth Symphony, in D minor (ML 5571-MS 6171), and the young and rising Thomas Schippers conducts the same ensemble in *Orchestral Music from the Opera* (ML 5564-MS 6164).

As to American composers, a notable issue in Composers Recordings (CRI 127) includes Carl Ruggles' *Organum*, Douglas Moore's *In Memoriam* and Robert Ward's *Symphony No. 2*. These are recorded by the Japan Philharmonic Orchestra; the first was conducted by Akeo Watanabe and the other two by William Strickland. The Ruggles' piece is perhaps the most impressive of the three. It was written more than thirty years ago and is fresh, vigorous and free of cant. Dr. Moore's music, founded solidly upon scholarship and classico-romantic tradition, holds some rare moments of integrated beauty. The Ward symphony hardly stands up against the strength of the other two.

Yet another album by Composers Recordings (CRI 131) revives three American works that should not be forgotten. They are Roger Sessions' Symphony No. 1, William Bergsma's *Music on a Quiet Theme* and Russell Smith's *Tetrameron*.

BIRGIT NILSSON

By NICHOLAS G. DEMOS



LYNN PELHAM FROM RAPHO-GUILLUMETTE

ON the evening of December 18, 1959, in New York City, a Swedish soprano named Birgit Nilsson made her Metropolitan Opera debut. Few in the audience that night knew a great deal about Nilsson and fewer still had ever heard her sing before. But at the end of the first act they gave her a thunderous ovation and at the conclusion of the performance the audience cheered and clapped for fifteen minutes before they let her go home. The next morning she received the most sensational reviews since the great Kirsten Flagstad made her debut from the same stage in 1935.

Nilsson chose for her *première* performance the role of Isolde in Richard Wagner's opera *Tristan and Isolde.* Wagner placed unusually difficult demands upon his sopranos, and the role of Isolde is one of the most strenuous, requiring great physical strength and vocal power. Nilsson has both strength and power, as well as range and sensitivity and tone. She was, in her debut, as one critic put it, "the laughing mistress of every difficulty." Her voice soared through the large auditorium of the Metropolitan. Although she is not a particularly large woman as Wagnerian sopranos go, she can muster great vocal reserves, making her voice heard clearly over the orchestra and to every corner of the opera house. Her range is more than two octaves and, although her voice can be slightly harsh at times, it also glows with great warmth and feeling.

Nilsson must have been as pleased with her reception in New York as she was bemused. Although she arrived like a meteor on the American musical scene, she was hardly an unknown either in Europe or even in America. She had been singing in European opera houses for a number of years and had become one of the leading dramatic sopranos there. Although she would not reveal her age—"In Europe nobody asks a lady that"—she is older than Flagstad when the latter made her debut at the Metropolitan. That would make Nilsson in her late thirties. In any case, as far as her fans in the United States were concerned, her fame had to wait until she arrived as Isolde on the stage of the Metropolitan. Audiences took to her immediately and her success was assured.

Nilsson was born in Sweden, in the township of West Karup, the daughter of farming parents. The young Birgit started singing for pleasure when she was very young. Her father's cousin Sven Nilsson was a singer, who performed at the Dresden Opera for a number of years as well as at the Metropolitan. Her mother, too, sang, in the little choir of the local church.

Birgit's father was delighted with the musical talent of his young daughter. When she proposed to go to Stockholm to study music professionally, however, he opposed the idea. It was her mother who interceded and finally packed her off to Stockholm to audition at the Royal Academy of Music.

Nilsson greatly impressed the judges there at her audition and she was promptly enrolled as a student. Her voice teacher, Joseph Hislop, a Scottish tenor, started her on lyric roles—much to her disappointment. She wanted to sing Wagner immediately. She now admits the wisdom of her teacher's policy. Her voice gained in lightness and suppleness and her repertoire was enlarged to a considerable degree.

After several years of study, she made her debut at the Royal Opera in Stockholm in 1947 as Lady Macbeth in Verdi's opera *Macbeth.* (Previously she had been called in as a last-minute substitute for a soprano in Weber's *Der Freischütz,* but that is an experience she says she would rather forget.) In the following years in Stockholm she sang a number of roles—Venus in *Tannhäuser*, the Marschallin in *Der Rosenkavalier,* Donna Anna in *Don Giovanni,* Aida, Tosca—gaining in experience and language ability. (She now speaks Swedish, German, Italian and English.)

Her success in Sweden came to the attention of the organizers of the Glyndebourne festival in England. She was engaged to sing there in 1951 in the role of Electra in Mozart's *Idomeneo.* She soon became one of the most sought-after sopranos in Europe. She has sung in Bayreuth, Munich, Vienna, Milan, Lisbon, Barcelona, Rome. Her roles have varied from Brünnhilde to Salome, and to each she has brought her remarkable vocal ability. On August 9, 1956, she made her American debut singing Wagner at a concert in the Hollywood Bowl, and later in the same year she sang in *Die Walküre* at the San Francisco Opera. Everywhere she was greeted with enthusiastic reviews and joyous applause. Finally the Metropolitan could resist her no longer and she was signed for the 1959–60 season. Her debut there made musical history.

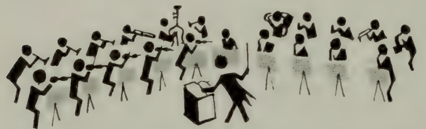
As time goes by, Nilsson's voice will, according to critics, probably improve still further. The occasional "whitish" tone, they believe, will disappear and her voice will become richer and more expressive. She has already been signed to open the 1960–61 Metropolitan season in the title role of Puccini's *Turandot. Turandot* and *Tristan and Isolde* are her two favorite operas.

Nilsson's domestic life is as happy as her musical life is successful. She has been married for more than ten years to Bertil Niklasson, a Stockholm restaurant owner. They shuttle between homes in Stockholm and Zurich when Miss Nilsson is not fulfilling her numerous singing engagements in Europe and America.

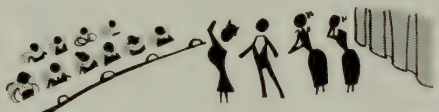
FACTS and FIGURES

MOUNTING INTEREST IN MUSIC

THE 1959–60 concert season focused attention on the ever growing interest of the American people in music. The American Symphony Orchestra League reported that more concerts were sold out and that ticket sales were higher in all cities than in any year since the league began keeping records. The league estimates that in 1959–60 there were 1,200 orchestras in the United States, whereas there were fewer than 100 in 1920 and only 10 in 1900. Of 270 college orchestras and about 100 youth orchestras, more than half have been formed since 1947.



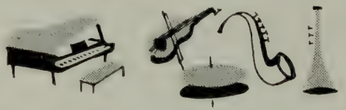
Opera is playing an increasingly important role in American musical life, with accent on contemporary operas. *Opera News*, the Opera Guild magazine, reported that during the 1959–60 season there were 2,084 performances of 165 modern operas, most of them the works of American composers. The total number of performances by American opera companies during the season was 3,995, an average of more than 11 performances a day. *Opera News* pointed out that there are now 727 organizations producing opera in the United States. Of these, 200 are college groups and 133 high-school organizations.



Radio plays a major part in bringing concert music to large audiences. Broadcast Music, Incorporated, reports that with more than 156,000,000 radio sets in operation and the average American family listening approximately 13.75 hours a week, radio is bringing more music into homes than at any other time during its forty-year history. An indication of the tremendous radio audience available for concert music is the fact that more people hear a single broadcast of the New York Philharmonic Orchestra than could hear it in Carnegie Hall in 110 years. A Broadcast Music survey of broadcasting stations disclosed that, as of May 1960, 1,145 AM stations and 117 FM-only stations carried a weekly total of 13,300 hours of concert music, or an average of 10.5 hours per week per station. In 1955 the average was 6.5 hours.

There are more than 75 national music organizations in the United States, with more than 1,000,000 members devoted to furthering the cause of concert music. In addition there are more than 200 music organizations, associations, unions, guilds, fraternities and sororities.

Americans spend far more money for music than they do for spectator sports. Broadcast Music points out that the total of $305,000,000 spent in 1959 for spectator sports is just about equal to the expenditure for hi-fi equipment in that year. About $100,000,000 was spent for purchase of recorded concert music in 1959, and *Variety* estimates that Americans spend $50,000,000 annually for concert tickets. American Symphony Orchestra League figures show that 45 American symphony orchestras have budgets exceeding $100,000 and the budgets of 23 are more than $250,000.



Another area of musical development is reflected in the sale of musical instruments which topped the $500,000,000 mark in 1959. This is six times the 1939 total and well over twice that of 1949. Approximately 85 per cent of all band instruments and 65 per cent of all pianos were purchased for the use of school-age children. The Music Teachers National Association estimated that there are 500,000 music teachers in the United States and more than 250 educational institutions that offer degree courses in music and advanced-level musical training.

It is estimated that today 31,000,000 Americans play musical instruments, as compared with 14,300,000 in 1936. More than 21,000,000 play the piano. This represents an increase of 60 per cent over the past twenty years and makes the piano the most popular American instrument, according to the American Music Conference. The guitar ranks second, currently, with 4,450,000 players. Then come violins and other stringed instruments, 3,200,000; woodwinds, 2,700,000; brasses, 2,650,000; organs, 2,300,000; accordions, 1,300,000; "C" melody flutes, 1,250,000; harmonicas, 550,000; ukuleles, 500,000; and drums, 300,000.

Promise for the future of musical enjoyment in the United States is seen in American Music Conference estimates that 9,000,000 children now are playing instruments and receiving musical instruction in schools throughout the country and from private teachers. In contrast there were 2,500,000 in 1947. The number of school musical organizations has more than doubled since World War II to an estimated 26,000 orchestras and 47,000 bands in 1959.

Used with the permission of Broadcast Music, Inc.

PRIZES AND AWARDS: BOOKS, MUSIC AND ART

ART

Erasmus Prize ($15,000)	Marc Chagall, France, and Oskar Kokoschka, Great Britain
Guggenheim International Award ($10,000)	Karel Appel, Netherlands
Pan-American Exhibition Awards ($2,500)	
Painting by a Mexican	Rufino Tamayo, Mexico
Painting by a non-Mexican	Oswaldo Guayasimin, Ecuador
Sculpture	Marina Muñez del Prado, Bolivia
Engraving	Oswaldo Goeldi, Brazil
Reynolds Memorial Award ($25,000)	Jean Tschumi, Switzerland

JOURNALISM

F. Wayland Ayer Cup for appearance	*The Emporia* (Kan.) *Gazette*
George Polk Memorial Awards	
Foreign reporting	A. M. Rosenthal of *The New York Times*
National reporting	Nathaniel M. Gerstenzang of *The New York Times*
Magazine reporting	*The Times* (London) *Literary Supplement*
Photography	Rangaswamy Satakopan, *AP*, New Delhi
Metropolitan reporting	William Haddad and Joseph Kahn of *The New York Post*
Special award	Wilbur Schramm, for *One Day in the World's Press: Fourteen Great Newspapers on a Day of Crisis*
Pulitzer Prizes ($1,000 each)	
International reporting	A. M. Rosenthal of *The New York Times*
National reporting	Vance Trimble of Scripps-Howard
Local reporting under deadline conditions	Jack Nelson of *The Atlanta Constitution*
Local reporting under nondeadline conditions	Miriam Ottenberg of *The Washington Evening Star*
Editorial writing	Lenoir Chambers of *The Norfolk Virginian-Pilot*
News photography	Andrew Lopez of *UPI*
Public service	*The Los Angeles Times*

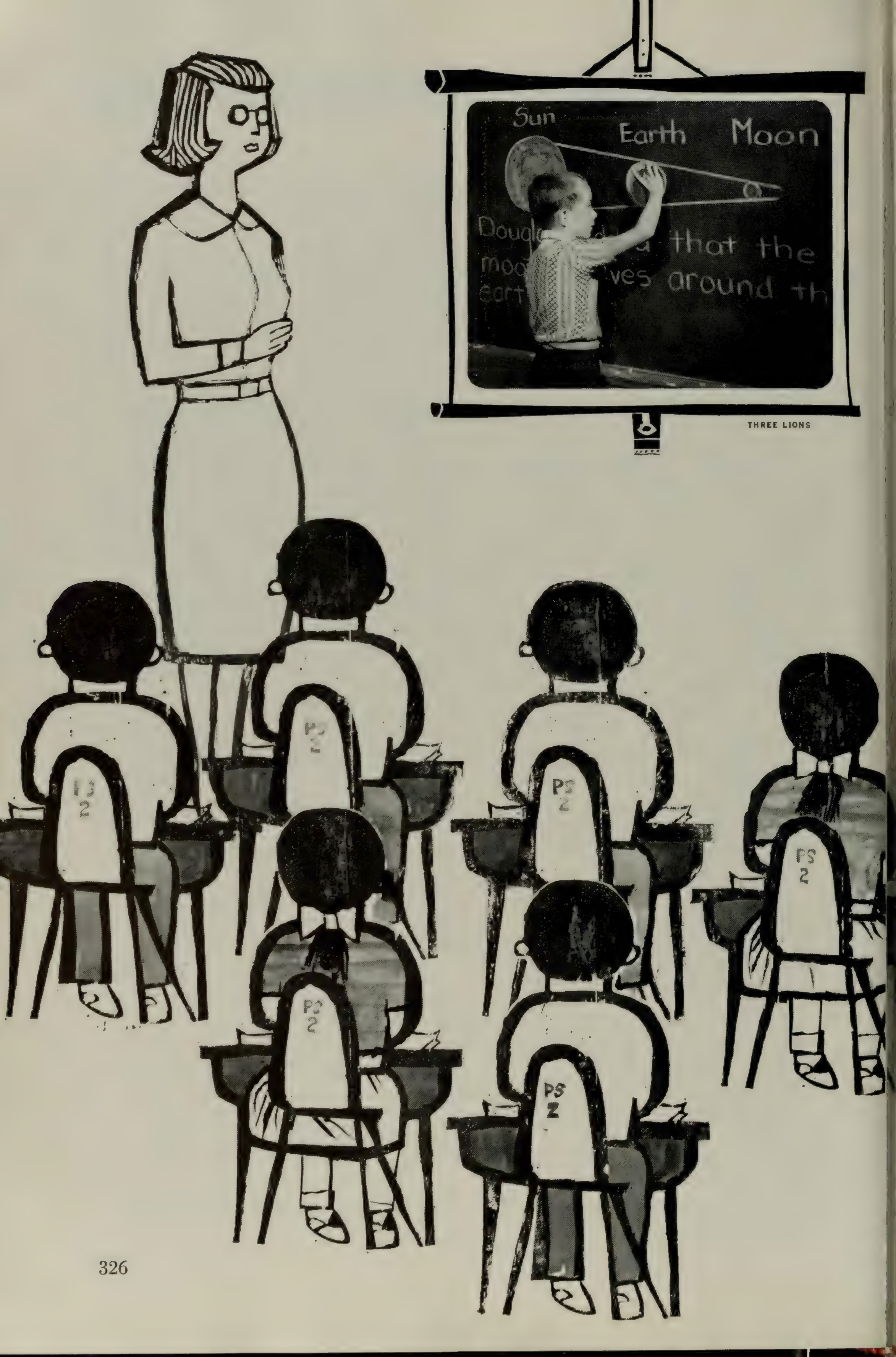
LITERATURE

Bancroft Prizes ($3,000 each) for American history	Margaret Leech, *In the Days of McKinley*, and Professor R. R. Palmer, *The Age of the Democratic Revolution*
Bollingen Prize ($2,500) for poetry	Delmore Schwartz, *Summer Knowledge*
Caldecott Medal, American Library Assn.	Marie Hall Ets, *Nine Days to Christmas*
Governor General's Awards (Canadian)	
English fiction	Hugh MacLennan, *The Watch That Ends the Night*
French fiction	André Giroux, *Malgré tout, la joie*
English poetry	Irving Layton, *Red Carpet for the Sun*
French nonfiction	Félix Antoine-Savard, *Le barachois*
Grolier Society Award ($500)	Margaret C. Scoggin
Howells Medal of the American Academy of Arts and Letters	James Gould Cozzens, *By Love Possessed*
National Book Awards ($1,000 each)	
Fiction	Philip Roth, *Goodbye, Columbus*
Nonfiction	Richard Ellmann, *James Joyce*
Poetry	Robert Lowell, *Life Studies*
Newbery Award, American Library Assn.	Joseph Krumgold, *Onion John*
Nobel Prize for literature ($43,700)	Alexis Léger (St.-John Perse), France
Pulitzer Prizes ($500 each)	
Biography	Samuel Eliot Morison, *John Paul Jones*
Fiction	Allen Drury, *Advise and Consent*
History	Margaret Leech, *In the Days of McKinley*
Poetry	W. D. Snodgrass, *Heart's Needle*
Special citation	Garrett Mattingly, *The Armada*

MUSIC

Pulitzer Prize for music ($500)	Elliott Carter, Second String Quartet

NOTE: Unless otherwise noted, all prize winners are from the United States.


Sun
Earth
Moon
Dougl
that the
moo
ves around th
eart
PS 2
PS 2
PS 2
PS 2
PS 2
PS 2

THREE LIONS

SCHOOLS and EDUCATION

PROBLEMS

The American Educational System and Its Critics
Fred M. Hechinger 328

NEW TECHNIQUES

Team Teaching
Clarence W. Hach 332
Teaching Machines
Lewis D. Eigen 335
MPATI—Experiment in Education
John E. Ivey, Jr. 338

NEW LOOK

Changes in Science Teaching
Rose Lammel 341
Campus Layout for High Schools . 344
Vertical Campus 346

FACTS AND FIGURES

Growing Pains in United States Education 348
Increase in Language Studies 349
Student-Exchange Programs 350

The American Educational System and Its Critics

By FRED M. HECHINGER
Education Editor
THE NEW YORK TIMES

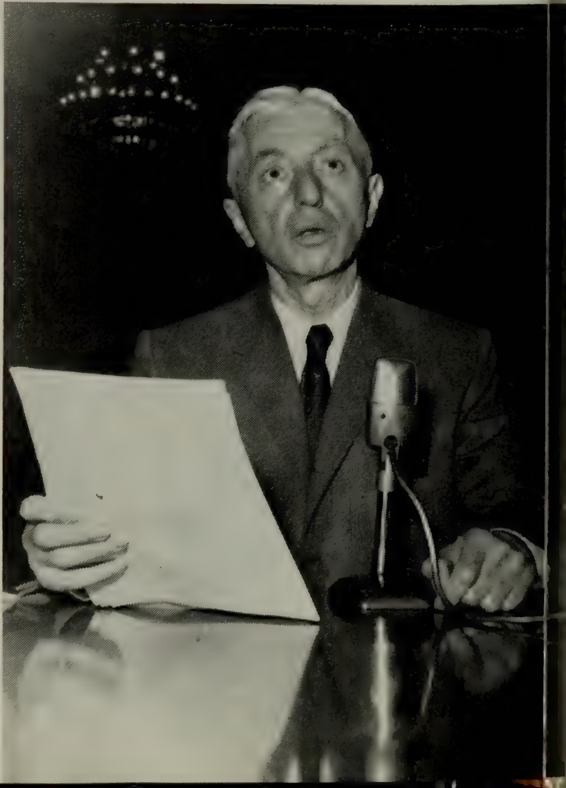
AMERICAN public education, next to government itself, is probably the most fiercely analyzed and criticized of all national enterprises. This is the inevitable result of the widespread concern for education, the great role attributed to the schools as the gateway to a free and fluid society and the fact that the process of "getting an education" is both compulsory and tax-supported. Every citizen who has gone to school feels that he has some claim to be considered an expert on some or all problems of education. Finally, intensified world competition on all fronts—economic, military and ideological—has put a new premium on American education, thus exposing its real and imagined flaws to even more cutting criticism.

Almost one fourth of the entire population—about 48,000,000 persons—is enrolled in formal, organized education at some level. The number of those interested in education has not only greatly increased but has also become extremely vocal. These are some of the most significant criticisms or waves of critical opinion that have influenced or attempted to influence American education recently:

The schools in the late 1940's and 1950's were repeatedly attacked for alleged left-wing or procommunist leanings. Most often, fire was concentrated on textbooks, largely by ultraconservative persons or organizations; they appeared to confuse the schools' recording of social changes with advocacy of such change. As a result, citizen groups in many communities demanded removal of certain books both from the list of texts and from the library shelves.

Since the middle of the 1950's, this kind of criticism has largely subsided. There remains, however, a tendency to censor the readings of students. But this form of criticism is generally based on moral rather than political objections. Depending on the attitudes of local citizens and the strength of local school boards, some of these critical attempts to purge the reading lists have failed and others have succeeded.

But the more important aspect of criticism of modern American education is


UPI

Vice-Admiral Hyman G. Rickover challenges the schools to require more demanding work of students.

based on curriculum and content, rather than on the materials used. The complaints most frequently lodged against the schools are that they have grown too permissive, that they let the students pick and choose too much and that too many able students are therefore allowed to complete their schooling without the study—and sufficient knowledge—of what are generally called the "solid academic subjects." This criticism has been intensified since the launching of the first Russian space satellite—the sputnik—and the subsequent extensive comparisons made between the subjects studied by American and Russian students.

Such academic critics as Robert M. Hutchins, former president of Chicago University and president of the Fund for the Republic, have long been critical of what they called "bargain-basement" or "supermarket" approaches to education. More recent critical forays have been led by such writers as Arthur Bestor and John Keats. Mr. Bestor, a historian, established his reputation as a leading critic of modern education with his book *Educational Wastelands: The Retreat from Learning in Our Public Schools.* Mr. Keats made a more popular appeal with a similar theme in his book *Schools without Scholars.* Both had already been preceded by an even more violent critique—Albert Lynd's *Quackery in the Public Schools.*

The common thread that runs through these critical volumes is that the content of public education has been watered down, that the academic subjects—reading, writing and numbers in the early grades and English, foreign languages, mathematics, science, history and geography in the more advanced school years—have been crowded out by what some modern educators have called "life adjustment" courses. Too many of those who plan the curriculum, say these critics, are experts only in the *method* of teaching but know too little about the *content* of true education. Mr. Bestor, particularly, urges that the scholars—historians, scientists and so on—resume the controls.

WIDE WORLD

John Dewey broke ground for progressive education although he should not be blamed for its extremes.

Common, too, to much of this criticism is the debate over the relative merits and faults of the liberal arts and the teachers colleges. The charge most frequently made is that the teachers colleges have given too much of their time and emphasis to the teaching of methodology—too much instruction *about* academic subjects and not enough *in* them. It must be added that the defenders of teacher education frequently point out—and document their reply—that the liberal-arts colleges failed to concern themselves sufficiently with the training of teachers. Consequently, in a mass education system that needs great numbers of teachers, the domination of the field went to the teachers colleges by default rather than by design.

While the critics of modern education are mainly concerned with content, they also attack some of the modern methods of teaching. They object, for example, to the increase of mass testing and to the tendency to crowd out the old form of the essay test and to replace it with objective tests characterized by true-false and mul-

UPI

Dr. James Bryant Conant has worked out specific reform plans for junior and senior high schools. His ideas are already influencing the teaching of such subjects as languages.

tiple-choice questions. They point to this trend as just one more reason for what they charge is the decline in true literacy.

The organization most prominently in support of the critical review of modern American education is the Council for Basic Education, which describes itself as a "non-profit educational organization pledged to the encouragement and maintenance of high academic standards in American public schools." It issues a monthly bulletin edited by Mortimer Smith, who earlier wrote the book *The Diminished Mind* characterized by its subtitle: *A Study of Planned Mediocrity in Our Public Schools.*

It is Mr. Smith's belief that the primary function of the school is "to transmit the intellectual and cultural heritage and knowledge of the race, and in the process to teach young people to think and to buttress moral values." He charges that the schools, while paying lip service to these aims, have pushed them to the "periphery." It should be noted that Dr. John H. Fischer, the dean of Teachers College of Columbia University, the institution most frequently blamed by the critics as having set the pace and the tone for modern education, in his first major address in 1960 asked the schools to shed some of their noneducational functions. His definition of the purposes of public education came very close to Mr. Smith's.

Since the Russian sputniks, the most vocal critic of the American schools has been Vice-Admiral Hyman G. Rickover, the father of the atomic submarine. He has set forth his belief in the book *Education and Freedom,* in which he challenges the American schools as having neglected such fields as physics and modern languages in favor of academically less demanding elective subjects. Although he has been attacked by some educators as focusing too narrowly on the Soviet example, Admiral Rickover actually has asked the schools to study the European school approach, with its more rigid demands on students. He warns against permitting a variety of pressure groups to determine the quality and content of education. In his view, the responsibility of the schools is directly linked to the national battle for survival. He also calls for a far greater effort to support education financially.

Many of the critics of the current system have been actively at work trying to improve the schools. One of the most outspoken leaders toward a new synthesis out of the best usage of the past and the most urgent recommendations of the critical observers is Dr. Paul Woodring. He first replied to what he considered extreme attacks on the American school system with a moderate and clearly reasoned book, *Let's Talk Sense about Our Schools.* In it he pointed to the experimental and daring nature of the American venture into a mass-education approach, in magnitude beyond anything ever tried by any nation or civilization before. He asked that the extreme critics reconsider these historical facts, instead of attributing all the shortcomings of the American school to the theories of progressive educators and their patron saint, John Dewey.

In Dr. Woodring's second book, *A Fourth of a Nation,* he set forth his own criticisms but, more important, an outline of how to improve the system. He called for an end to the patchwork remedies that frequently were the result of hastily thrown-up defenses against critical attacks. He sketched a new, over-all program to plan the curriculum from kindergarten through college. His most important reform plans—and his most outspoken insistence for priority action—dealt with the key to improvement of learning, teacher training.

The new phase of criticism takes the form of reform plans and action. The Rockefeller Report on *The Pursuit of Excellence* was highly critical of insufficient current effort and expenditures as well as of a great lag in the nation's search for talent, particularly among the economically less privileged. But it also outlined courses of action and estimated the need of adequate financing to be about double its existing volume.

Other critics have been urging a reform of the school organization and administration. Myron Lieberman, in his book *The Future of Public Education,* urged that a truly professional organization of educators assume greater power over school planning. A number of experts, such as New York State Commissioner of Education Dr. James E. Allen, Jr., Dr. Finis E. Engleman, executive secretary of the American Association of School Administrators, and again Admiral Rickover, have been calling the traditional system of extreme local option both outdated and dangerously wasteful. They do not call for an abolition of local control, but seem to agree that some national advisory group should be established to give the local school districts, of which there are still more than 42,000, greater common goals, national direction and minimum standards.

These critics are joined by such observers as Alvin C. Eurich, director of the Fund for Advancement of Education, and Philip H. Coombs, director of Research for the Ford Foundation, in a demand for far greater stress on educational experimentation and research and for less rigid conforming to established patterns. Other foundations, notably the Carnegie Corporation of New York, have put their critical yardstick to such areas of the curriculum as mathematics, physics and English study. They have commissioned scholars to revise the existing curriculum and to help bring teachers and textbooks up-to-date.

No report on the critical reappraisal of American education could be complete without a review of the efforts of the chief architect of active reform, Dr. James Bryant Conant. With his critical report on *The American High School Today* and its follow-up study of the American junior high school, Dr. Conant has probably given the expedient and pragmatic answer to the demands of most critics. He has urged—and has begun to achieve—higher and more cohesive academic standards, at least for the able students in such areas as English, mathematics, social studies, science and foreign languages.

There can be little question that the critical approaches to education, with the exception of the brief and violent excursions into censorship and political name calling, have been an important chapter in the American education story, largely responsible for a great measure of rejuvenation. Moreover, there are growing indications of greater areas of agreement and even co-operation among traditional educators and some of those observers who used to be their most violent critics.

NEW TECHNIQUES

TEAM TEACHING

By CLARENCE W. HACH

EVANSTON (ILLINOIS) TOWNSHIP HIGH SCHOOL

"A DEMOCRACY demands of its education both *quantity* and *quality*. Never before have so many been educated so well in the United States. . . . The challenge of *quantity* has largely been met. Most of America's youth are in schools and most classrooms have teachers. . . . But the challenge of *quality* is now more difficult to meet than ever. . . . A superior school today may be an inferior school a decade from now—unless bold, imaginative steps to improve *quality* are taken." These conclusions are presented in the pamphlet *Images of the Future*, by Dr. J. Lloyd Trump, Director of the Commission on the Experimental Study of the Utilization of the Staff in the Secondary School.

To further the quest for *quality* education, the concept of team teaching has been evolved as one of those "bold, imaginative steps." In its simplest form it is nothing more than co-operation between two or more teachers of the same subject and grade level in the instruction of two or more classes. These classes occasionally meet together to have a particular unit of study explained to them, to hear a lecture or to take an examination. In its more complex form, team teaching incorporates the "school within a school" idea of some of the largest schools. In these large schools classroom teachers and counselors have difficulty in knowing and understanding their students, and students often move from one year to the next almost on their own. Under this more complex team plan, four to six teachers of major required subjects, with a counselor, band together into a teaching team, with 125 to 175 students for a two-year period. The teachers and counselor work as a small independent unit to plan the program of instruction for these students, each one of whom is taught by all of the teachers on the team. Students in such a project have the benefits of a small school without losing those of a large one.

The idea of team teaching is not really new, for universities long have used many of these procedures. Large groups of university students, sometimes as many as five hundred in a single group, meet regularly to listen to an authority or to a

NEWSWEEK—TONY ROLLO

particularly able teacher. Then they meet in small groups during other class periods with discussion leaders who are perhaps less renowned or distinguished. It is common in the large classes to have attendance taken by a clerk, examinations administered by aides, illustrative materials prepared by an assistant and objective tests and routine papers checked by nonteaching personnel. Under this system large numbers of students hear an excellent lecture by a teacher in the area of his specialty. The lecturer, freed from nonteaching duties, has time to prepare a well organized and interesting presentation. Such a teacher, too, with increased status because of the nature of his work, is likely to earn a higher salary than one who can teach only small groups of students.

Team teaching in the elementary and secondary schools, while similar in some ways, differs somewhat from the university system. All teacher-team members co-operate in the planning and share the responsibility of teaching the large groups, according to their particular strengths and talents. The teacher most able in a particular area is in charge of work in that field. For example, one member of a teaching team may have made Mark Twain's *The Adventures of Huckleberry Finn* a specialty. How much more valuable and interesting for students to hear that teacher, who has had time to prepare a well-organized presentation with audio-visual aids, than to have all teachers individually introduce the book in their own classes, many perhaps in an uninspired way. In an elementary school one of the teachers with special training in remedial reading may instruct a group of retarded readers, while another works with a group of superior readers.

One advantage of team teaching is the flexibility it allows for grouping students at various times according to their achievement in particular areas. A group in plane geometry, for example, after a major test might be divided into three sections: those experiencing serious difficulty; those showing only average achievement; those showing above-average understanding. Each group could benefit from concentrated instruction in a particular area.

Many advocates of team teaching believe that the typical class of 25–35 students meeting 5 days a week on an inflexible schedule will soon be out-of-date. They believe that this system will give way to one that permits groups of 100 or more when material to be presented is appropriate for such grouping. They envision groups of 12–15 when problems need solving and areas of agreement and disagreement need to be reached. In addition there would be individual study or groups of 2 or 3 for conferences with teachers, library reading, listening to records and tapes and the like.

According to *Images of the Future*, "A class of 25 is unnecessarily small for large-group instruction activities. Not only is the size financially uneconomical, but also it means deadening repetition for teachers who must go over the same materials for several sections. Moreover, because classes are limited to 25 to 35 students, present teaching schedules usually require a teacher to conduct 25 (or more) classes a week. With a teacher's other activities, this leaves insufficient time for preparing instruction, developing imaginative teaching materials, coun seling individual students, evaluating students, and keeping professionally up to date.

"Today's class of 25 to 35 is too large for effective *study*. Freedom of movement, independent creative activity, and development of student responsibility for learning are difficult in a group of this size.

"The class of 25 to 35 is also too large for successful *discussion*. Research in group process indicates that a group cannot be larger than 12 to 15 if there is to be effective participation of all its members."

Team teaching has evolved primarily to improve the quality of education. It also helps to alleviate the shortage of capable teachers; to improve salaries and status by providing positions of leadership and responsibility; to free teachers for teaching by providing aides and to provide opportunities for beginning teachers to work as interns.

Not all of the more than 91 schools in the United States that are currently using teacher teams incorporate all of the special features possible in this kind of teaching. One, in Lexington, Massachusetts, involves an entire large elementary school. It includes some home-room groupings, interchange of pupils between teachers, large-group meetings and small-group sessions. Team leaders and senior teachers work in a supervisory capacity with less experienced teachers assigned to each team. Assisting the teams are three clerical aides who work 80 hours a week performing nonteaching duties. In Evanston Township High School, Evanston, Illinois, one of the first high schools to experiment with teacher-team projects, 12 teacher teams involving 32 instructors teach 12 different courses cooperatively to 2,500 students. Not all teacher-team projects are organized alike. They range from one in senior English, involving 320 honors and above-average students, taught in 2 periods by 5 teachers (2 inexperienced), to freshman general mathematics for 125 average and below-average students taught during one period by 2 experienced teachers.

The use of teacher teams does not cost taxpayers more than the usual kind of instruction, although team leaders or senior teachers generally command higher salaries. The additional money used to pay these specialists is available because the teacher aides, who perform clerical tasks that ordinarily take 25 to 40 per cent of a teacher's time, are paid less than the regular teachers whom they replace.

How well do teachers like this "instructional revolution," as someone has called team teaching? One team teacher believes she is working harder than she did before, but that her work is more creative, more professional and better organized. Another praised its flexibility: "It can fit every student's needs." A teacher with three years' team experience said he is benefiting directly from the ideas and methods of his colleagues.

And how do students feel about it? One high school girl said, "We like the fact that each teacher is presenting what he knows best. . . . When it comes to the smaller groups that are a part of this plan, we have a better opportunity to participate in discussion than we would ordinarily. . . . It makes school tougher, but we get more out of it." Most of the students who like being taught by teacher teams list "the variety of teachers and the kinds of group divisions" as the main reasons for their preference.

What is the future of team teaching for American education? Though it must still be labeled experimental, its steady growth suggests that it will soon become an integral part of teaching at all educational levels. The rapidly increasing school population, the continuing shortage of teachers and the high cost of education practically assure that team teaching will be a part of the educational format. It may, as many of its exponents firmly believe, truly be the "instructional revolution" that will solve the teacher shortage, enable schools to operate with reasonable financial resources and, in addition, make it possible for all American young people of the future to have truly superior educational experiences.

TEACHING MACHINES

By LEWIS D. EIGEN

Collegiate School Automated
Teaching Project

WHEN a student signs up for a beginning course in psychology at Harvard University, he enters upon a rare educational experience. He will learn a large part of this course with the aid of a box, a teaching machine.

The machine will present a statement with a blank to be filled in by the student. After he fills in the blank, the machine will present him with the correct answer or answers. The student thus finds out almost immediately whether his answer was right. Then the machine presents another statement with a blank. Each of these statements is called a *frame*. A frame not only requires that the student make a response that will be checked, but it also gives him information that will enable him to respond correctly to the frame that he is confronted with or to frames following that one. The machine itself does not teach: it is the collection of frames, or the *program*, that enables the student to learn.

The students at Harvard are by no means the only ones who are using teaching machines and programs to further their education. Hamilton College in Clinton, New York, Earlham College in Richmond, Indiana, and the University of Pittsburgh are three of the many colleges and universities that are, to some degree, using *programed instruction* (machines and programs).

In addition to New York's Collegiate School, many secondary and elementary schools, including public schools in New York City, Westport, Connecticut, and Denver, Colorado, have experimented with programed instruction in the teaching of many topics.

In the early 1920's, Sidney Pressey, a professor at Ohio State University, invented a machine that would present and score a multiple-choice test. After a student answered a question, Professor Pressey's machine would immediately indicate whether the answer was correct. Pressey realized that for the student to know immediately how he had fared in answering the question would improve learning as well as test automatically. Why should a student have to wait a day or two to find out whether his homework was correct? With Pressey's device he could find out immediately without the teacher's having to correct his work.

Professor Pressey's machine was not readily accepted and the merits of this type of device were not appreciated until recently, when Professor B. F. Skinner of Harvard University developed a machine similar to Pressey's. With the greatly increased knowledge of human behavior we now have, Professor Skinner and his associates were able to write programs for the machines to insure that effective learning would take place. His machine differed from Pressey's in that the student would write an answer (recall) instead of selecting an answer from a set of alternatives (recognition). After the student had written his response, the correct answer would appear and the student would have immediate knowledge of the results. The first major program in the Skinner style was written by James Holland, one of Skinner's associates at Harvard. It is this program that is used to help in teaching psychology at Harvard. Since the writing of Holland's program, many other programs of similar type have been written. Among them are programs on spelling, statistics, set theory, nondecimal arithmetic, logic, grammar, music, vocabulary and several foreign languages.

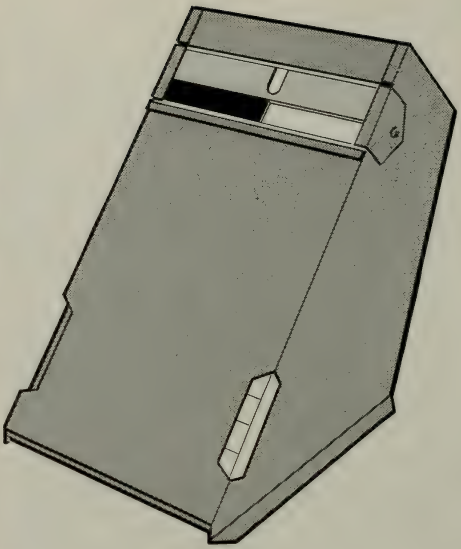
With a simple teaching machine, the student writes the answer to the question given; with her eraser she pushes up the paper to show the correct answer.

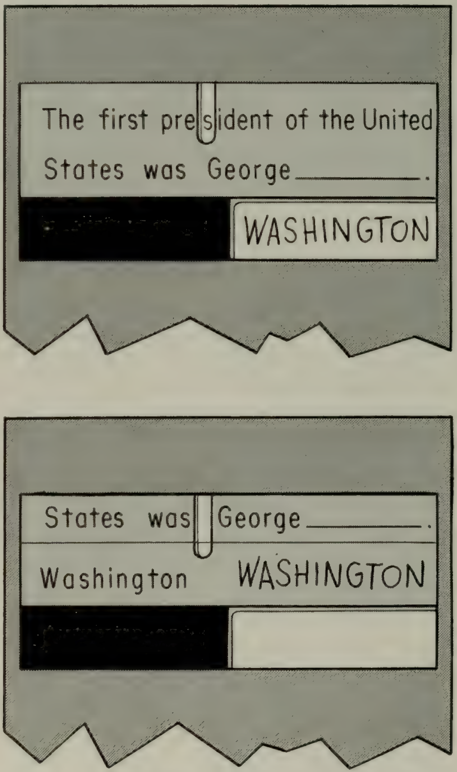
The following frames are typical of the Skinner type of programing:

Question: The *prefix* of a word is that part of the word which comes before the root.
The root of "import" is "port."
The prefix of "import" is "____."
Answer: im
Question: The root of "export" is "port."
The *prefix* of "export" is "____."
Answer: ex
Question: The ____ of "export" is "ex."
Answer: prefix

The characteristics of this type of programing are: 1. the student must construct his answer, and 2. there are very small "steps" between frames so that ideally the student will make no errors.

Another type of programing has been developed by Norman Crowder. This is a multiple-choice programing which has been called *"intrinsic programing."* Crowder, believing that it would be impossible to eliminate errors, developed a programing system that would "take advantage of the errors that the student





ALL PICTURES, TEACHING MACHINES INCORPORATED

1. The question is presented, the answer written in. Psychologists refer to this as stimulus and response. 2. The student immediately checks answer by moving sheet to show correct response. Psychologists call this reinforcement. Learning proceeds by a sequence of many small, easy steps, one at a time.

makes." When a student is presented with an intrinsically programed frame, he must select one of the multiple-choice alternatives. If his choice is correct, he is informed that he is correct and presented with the next frame. If he is incorrect, he is directed to a passage that will explain his mistake; then he is asked to select another of the original alternatives. Thus the student receives additional instruction, depending on the type of error he makes.

There are also some programs that are written in the original Pressey style—strict multiple choice.

It is not yet clear which of the programing methods is the most effective; more research is required.

Programed instruction essentially has three components—the student, the program and the device for presenting the program. This device is called a teaching machine and may be likened to the binding of a book; the program is, of course, the set of pages. This "binding" is often quite elaborate. It guarantees that the student will read the "pages" because he must actively answer questions throughout the reading. Sometimes this binding is combined with a synchronized tape recorder or even a motion-picture projector so that auditory stimuli can accompany the visual.

These teaching machines are often elaborate electronic devices costing thousands of dollars. An IBM 650 computer has even been used for this purpose, but there are many less expensive types. A very simple teaching machine is a deck of cards with the questions on one side and the answers on the other. Another simple machine is in the form of a book. A question is on one page and the answer is on the next. This arrangement of a program is called a *programed textbook.* It is suitable for programs of the Skinner and Pressey types. While many of the more elaborate machines are cheat-proof—the students cannot look ahead or change their answers—the programed text does not offer this advantage. Despite this, recent experimental evidence (Collegiate School Automated Teaching Project-Research Summary Number 1) seems to indicate that the programed textbook may be as good a presentation method as the more elaborate teaching machine. There is also a book-type teaching machine for the Crowder program; this is called a *scrambled textbook.* Depending on which alternative of a frame the student selects, he is directed to a given page of the book. This page will tell him that he is correct or direct him to a page that will correct any error that he has made.

When a student learns via programed instruction, he has several advantages:

He gets immediate knowledge of his results.

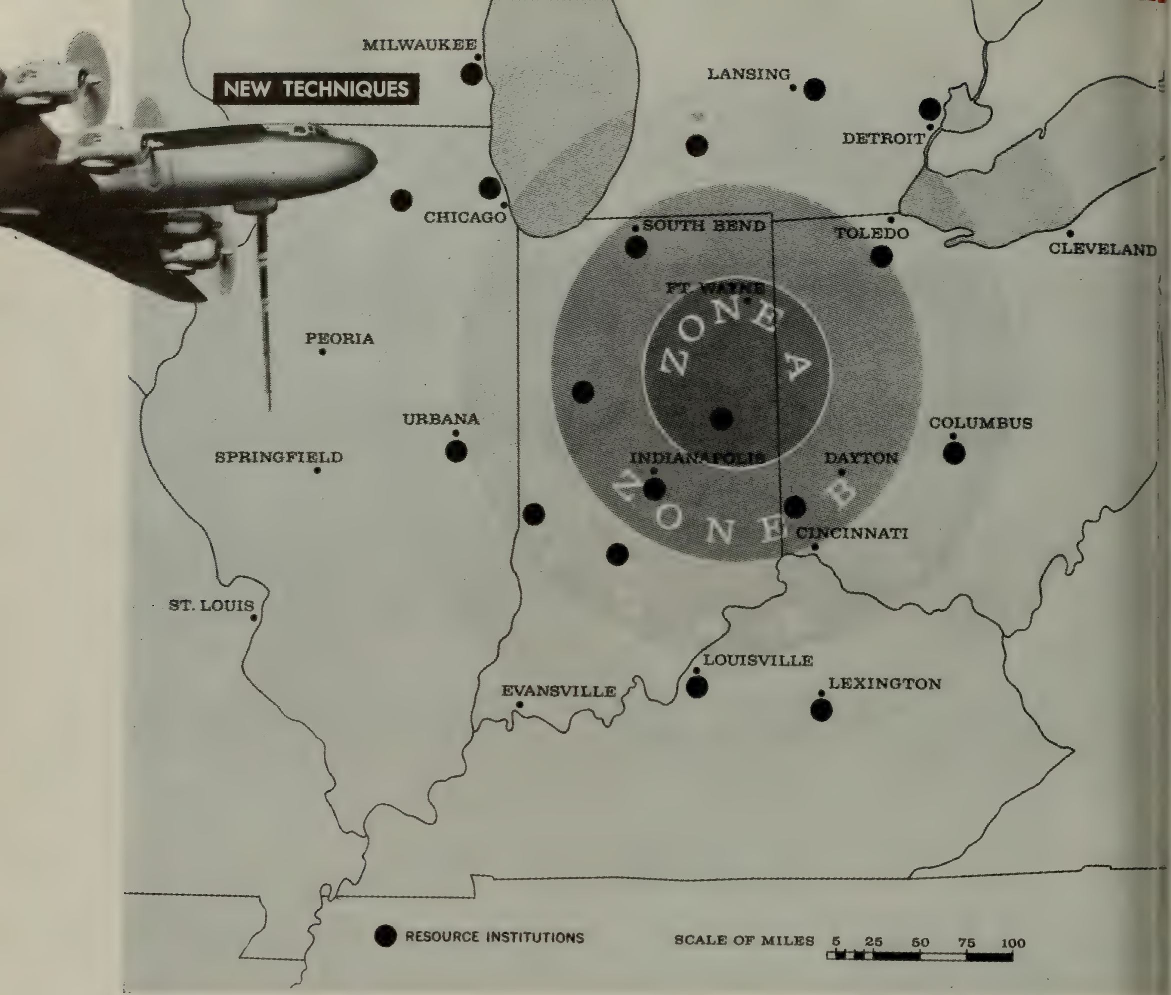
He is an individual learner. He is not held back by the class nor is he left behind. He proceeds at his own rate.

Other teaching, drilling and testing that are carried on at the same time make it virtually impossible for the student to go on to new material unless he has mastered the previous work.

Learning is efficient. All the student's time is spent engaged in the learning process—not in waiting for someone else to answer a question.

Automated teaching places the teacher in a position to utilize a new and efficient technique. Much basic material and some advanced material is easily programed. The teacher can relegate much of the curriculum to programed instruction and personally teach the things that only a human being can teach.

With a more complicated teaching machine, the student writes her answer by means of a keyboard.



MIDWEST PROGRAM ON AIRBORNE TV INSTRUCTION

MPATI—Experiment in Education

By JOHN E. IVEY, JR.

President, Midwest Council on Airborne Television Instruction

THE use of television for educational purposes is no longer an experiment. Whether instruction is presented on commercial stations, educational TV stations or closed-circuit school systems, the accumulated evidence is that television is an established and valuable teaching tool, if used properly. In the face of this evidence, few responsible educators would turn back the clock to pre-TV days. Most of them look forward to building upon existing educational television experience as well as expanding the technical means of its delivery.

The year 1961 marks the active or operating phase of an organized attempt to do just that, starting on a regional basis in the midlands of the United States. This attempt, which is indeed an experiment, is known as the Midwest Program on Airborne Television Instruction. MPATI, as it is called, was first announced in October 1959 as a proposal to beam instructional courses from an airplane to schools in six Midwestern states: Illinois, Indiana, Kentucky, Michigan, Ohio and Wisconsin. It has been estimated that more than 10,000 schools and some 5,000,000 students in the six states are within the 200-mile reach of the television signals from the airplane.

The first of these schools and the first of these students are now sampling the educational fare from the airplane flying at an altitude of 23,000 feet over north-central Indiana. They are pioneers of a "demonstration period" lasting from January 30 to May 25, 1961. This is a period of operation designed to allow schools to determine whether they can receive a satisfactory signal from the air-borne transmitters and, if they can, whether the lessons offered are of sufficient quality to merit their continued use in the school systems.

The results of the demonstration period will determine to a substantial degree how many schools will participate in the first full academic year of air-borne instructional telecasts scheduled to begin in September 1961. Any school or school system that receives a consistently satisfactory signal from the airplane is free to use the air-borne lessons and free to select whatever courses they wish from among those offered.

The schools pay for their own receiving equipment. This includes an outside antenna to pick up the signals, a converter to alter the signal so that it may be received on an ordinary home-type TV set, a distribution system of cables to "pipe in" the signals to classrooms and, of course, the TV receiving sets themselves. In addition, the schools must pay for printed instructional materials that supplement the courses offered. It has been estimated that equipping of five classrooms of a school fifty to a hundred miles from the air-borne transmitters costs approximately $500 per room.

Courses are being offered for students at all levels of education, from elementary through secondary schools and college. They include foreign languages, arithmetic, science, language arts, art, history, civics and other courses of general interest. A search was conducted to find the most outstanding teachers in the nation to prepare these courses. The teachers who were selected spent several months preparing the courses before they were filmed on video tape ready for telecasting from the transmitters on the airplane.

As the program progresses, the fact that the courses are being delivered from an aircraft will assume its proper unimportance. Yet the question needs to be answered: Why from an airplane? The airplane is simply a means of elevating a TV transmitter to a height where the signals can reach out a greater distance—150 to 200 miles or more, compared with about 50 miles when the transmitter is on the ground. Secondly, by using more than one transmitter on the airplane, two or more courses of instruction can be offered simultaneously. It has been estimated that as many as six channels could be utilized at one time. This would be a difficult and prohibitively expensive undertaking for any ground-based system serving a comparatively limited geographic area.

An air-borne TV system transmitting six simultaneous programs could provide seventy-two separate half-hour units of instruction during a six-hour school day. These units would cover a considerable portion of the entire curriculum of a school system at all grade levels. This is the "giant step" in the technical means of delivery that is made possible by an air-borne system. It has not been an easy trick and has challenged the know-how of some of the nation's best aviation, television and electronics engineers. Its feasibility, however, was demonstrated in a three-year experiment shortly after World War II, when Westinghouse Electric Corporation delivered a satisfactory signal from an air-borne transmitter operating at 25,000 feet to receiving sets as far away as 225 miles.

For education, the magic of the air-borne system lies not in its gadgetry, impressive as that is, but in its potential for helping the classroom teacher to increase the quality and effectiveness of classroom teaching.

This has been the dilemma of postwar education: How to educate far greater numbers of students than ever before?

How to improve the quality of education? How to do these at a cost that is within the bounds of present school budgets?

MPATI offers at least a partial solution to these questions. By making excellently qualified teachers available, not to one classroom but to hundreds at a time, the problem of boosting quality on a quantitative basis comes within reach of an answer. The air-borne TV system is particularly attractive to schools in small towns and rural areas where help is most needed. About one third of the school systems within the MPATI telecasting circle have student bodies of less than two thousand. For the most part, these are too small to provide a satisfactory education under present conditions. Not only do they have difficulty attracting talented teachers or specialized teachers for science, foreign languages and other subjects, but they cannot afford much of the expensive demonstration equipment, especially in science, that can be displayed on television. Television also can lift many burdens from the classroom teacher, permitting the teacher to work more intimately in individual and group learning situations with the students.

The cost of the air-borne experiment—approximately $7,750,000—is being met by allocations from the Ford Foundation and donations by private industry. If the experiment is successful, eventually the operating costs of the program must be shifted to the participating states and their respective school systems. It becomes economical to do this when the costs are distributed among several states and hundreds of schools. Figured on a per-student basis, costs, too, come within reach of realization.

Looking ahead, it is clear that if MPATI proves successful in delivering quality education on a quantity basis at low per capita cost, it should be continued not as an experiment but as an integral part of the educational systems of the six states affected. What form a long range organization should take is a question that needs to be discussed by educators and administrators at all levels in the respective state school systems. Television, like education itself, does not stop at state lines. When you combine the two and televise education from an airplane some four miles above the earth to school districts as far apart as three hundred to four hundred miles, you embrace a host of governmental units concerned with education—state, county, city and rural.

Thus the scope of the program, in itself, begins to define in broad terms the kind of organization that will be needed to carry on the air-borne instructional program. Perhaps an interstate educational compact of some kind will be required. Or the permanent organization might take the form of a voluntary association of school districts that are participating in the program. In any case, it seems obvious that the long-range organization will require public tax funds for its continued operation. The possible use of public money and the prospect of integration of the air-borne program with existing school programs make it urgent that there be a rigorous evaluation of the educational, economic and management phases of the entire program. This must be done on a local, state and regional basis throughout the telecast area.

In summary, the Midwest Program on Airborne Television Instruction aims at achieving these goals:

1. To broaden the range of educational offerings available to many schools.
2. To increase the quality of offerings in schools and colleges where resources are unavailable or inadequate at present.
3. To do these at a cost that is less than that for a comparable increase in quality achieved by other means.
4. To conduct the initial program in a manner that will assist the development of a permanent facility for the long-range management and financing of the program by local and state educational authorities.

If these ends can be realized, a new and vitally important chapter will have been added to the unfolding story of educational television.

NEW LOOK

Changes in Science Teaching

By ROSE LAMMEL

Professor, Science Education
Wayne State University

YOUNG people today are finding the study of science a far more exciting and rewarding adventure than students did even a decade ago. This adventure begins in the kindergarten and continues, for many, on through the college years. Parents and teachers, as well as scientists and the community at large, now as never before give their approval and encouragement to the student who is interested in science. In science classes, students are themselves questioning what scientific ideas actually mean. They are doing their own investigating and experimenting. They use the equipment they themselves have designed; they make their own observations and record the results. From the early elementary grades throughout the entire school program there is less reading and talking *about* science and more *doing*, more use of scientific methods in searching out solutions to problems. Young people are becoming more independent in their science learning; they experiment both as individuals and as groups. Science teaching, in bringing this about, has changed in both content and method in recent years.

Changes in the basic teaching of science have come about in many ways. First of all, scientific knowledge has been increasing at an explosive rate. This has made it necessary for educators to select carefully the material that is to be taught since, obviously, no one person can learn it all. Within recent years scientists and educators have begun to realize how few of the really modern theories and how little of the content of modern science have been included in school programs. As a result, large experimental projects have been set in motion to make science more important and significant in the schools. The aim is to make contemporary knowledge and modern points of view the core of basic science instruction. These large-scale projects, financed

Two high-school students, right, perform an experiment with zinc powder in the chemistry laboratory. The audience includes their teacher, second from left, and other members of their chemistry class.

HAYS, MONKMEYER

mainly by Federal funds and foundation grants, are greatly affecting the basic teaching of science.

A second reason for the fundamental changes in science teaching is the growing national concern that Americans should more fully understand the role of science in the affairs of modern man. When decisions must be made on issues having to do with applications of science, it is vital that those decisions be made from knowledge rather than from ignorance of things scientific. Every citizen has both the need and the right to become acquainted with the major ideas of science that affect his well being. Provisions are now being made for all students, throughout their schooling, to receive science instruction.

It is generally recognized in the United States that there is urgent need for an ever increasing number of imaginative and inventive scientists. Attention has been focused on this need because of unsolved problems on the frontiers of science, because of international tensions and the scientific achievements of competitor nations. Schools are responding by providing a variety of programs that will help boys and girls who have special interests and abilities in science to develop their talents.

Efforts to improve science instruction have been widespread. First of all, more science teaching is being based on modern ideas and theories. Emphasis is being placed on the fact that the sciences are interrelated—that there is a fundamental unity underlying the theories in the physical and biological sciences. More stress is being placed on basic ideas and less on technological applications. Even young children are becoming aware of some of the basic ideas of modern science through popular science programs on television and radio and through articles and pictures in newspapers and magazines.

In elementary grades and junior and senior high schools more advanced science is being presented. Younger children are now being taught science that was once considered appropriate only for children in the upper grades. They are thus prepared for deeper explorations of advanced scientific theories in later years of schooling. Some high schools are able to offer in the senior year advanced work in science that is equal to beginning college work.

New developments in mechanics, electromagnetic radiation, atomic physics and astrophysics are presented in the physics courses of today. Chemistry classes are making more mature studies of such subjects as atomic theory and the periodic table, chemical bonding and kinetic molecular theory. Students seek to understand the properties of elements in terms of orbital structure and atomic radii. Recent developments in microbiology, radiation biology and biochemistry are drawn upon. Cellular metabolism, the function of enzymes, as well as the role of vitamins and hormones in cell processes, are areas of interest in modern biological teaching. Laboratory work of an experimental nature is emphasized, with less attention than formerly to observation, classification and labeling.

There is increasing agreement among educators that one of the major objectives in science teaching is the development of the student's understanding of the nature of science and its methods. Much more important today than demonstrations and lectures by the teacher is experimentation and the solving of problems by the pupil himself. Methods of research are emphasized in the laboratory, where the student is expected to do his own investigating, and individual ingenuity is encouraged. Longer periods of time and a more leisurely approach are, of course, needed for such independent study. Modern science teaching clearly demands more adequate student working space and a greater variety of materials, tools and equipment. This holds true in the elementary schools as well as in secondary schools.

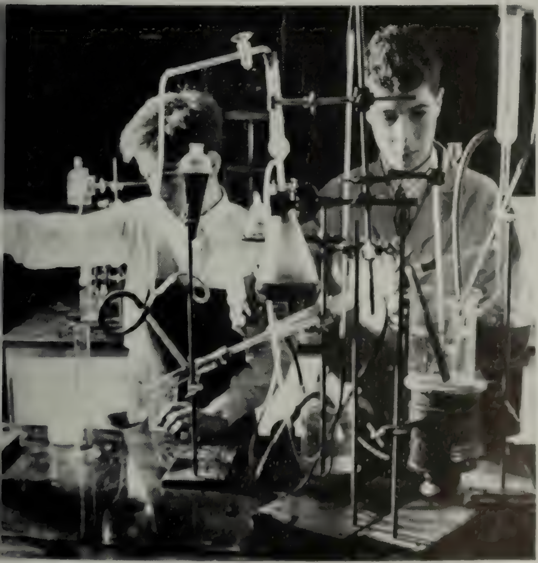
Many students carry on scientific experiments not only at school but, for instance, in science workrooms that they have set up at home. The search for help and advice extends beyond the school, also, and parents and specialists in the community are enlisted as research experts. Many science projects exhibited at fairs are the result of research and experimentation on problems of real concern to the exhibitor. Members of science clubs share their interests and plan investigations together. The young scientists also make good use of outdoor areas where they can pursue their particular interests—on nature trails and farms, in the forests and on some of the great preserves.

In some schools, students with special interests and abilities are benefiting from the extension of the science program to out-of-school hours. They also profit by being permitted to use nonschool facilities. Arrangements for further learning are often worked out, for instance, with nearby colleges, industrial concerns or scientific organizations. Saturday science programs, seminars and lecture series, before-school seminars, summer science projects in industry and summer science camps have all proved most helpful.

Up-to-date science teaching is making extensive use of many of the modern tools of instruction. Closed circuit and broadcast television are used in certain situations with increased effectiveness. Students and teachers work together in designing different types of mock-ups and demonstration equipment for use on-camera. Audio-visual aids are used increasingly by small groups of pupils or by those engaged in special projects. Tape recorders are used in collecting information and then in sharing it. Science teaching is benefiting materially from the provisions of the National Defense Education Act which, among other things, is making possible the addition of more and improved equipment in classrooms and laboratories.

As a result of their experiments pertaining to the preparation of organic dyes, these two high-school chemists have developed, from moth balls and carbolic acid, a new dye of beautiful reddish color.

AIGNER, MONKMEYER

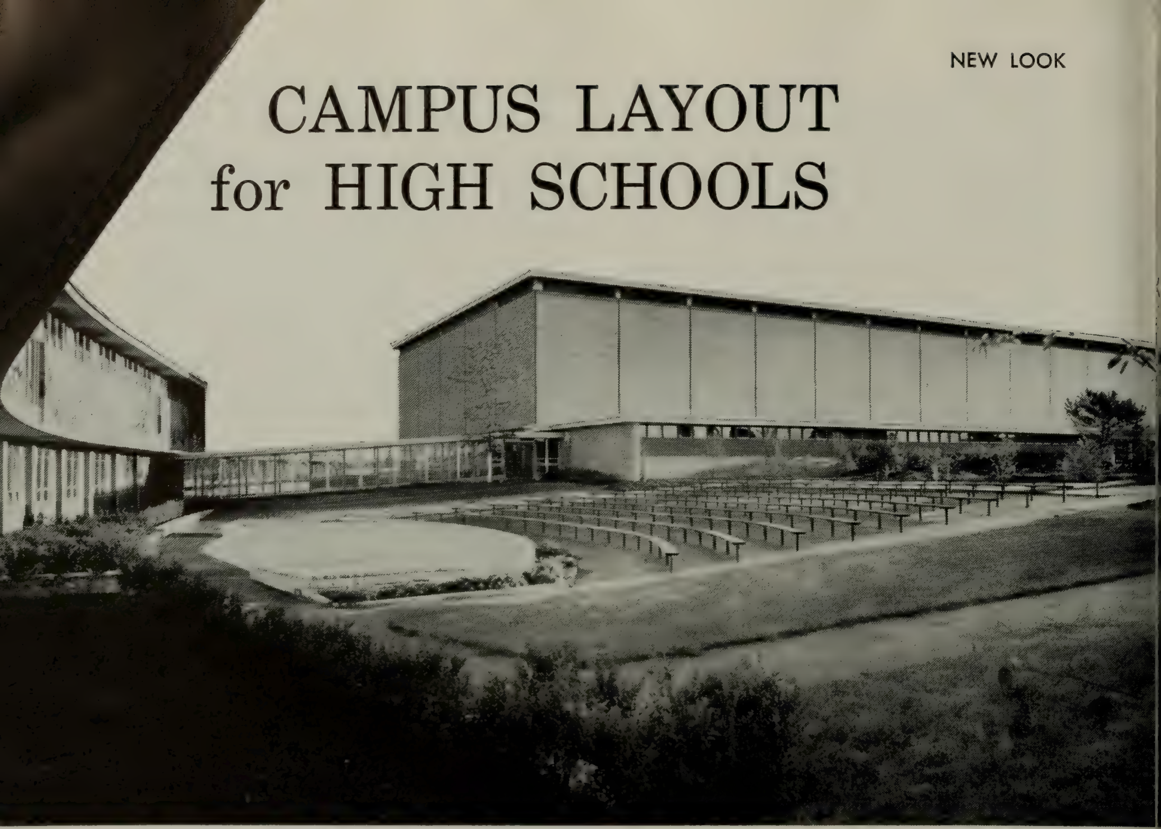


Forward-looking schools are recognizing that science must occupy a prominent place at all levels of education. Teachers, supervisors and administrators in local schools are working together to improve the quality of science teaching by planning for a continuing program from kindergarten on. Scientists at universities and in the local community are consulted and innovations in courses and administrative procedure are tried out. As this work and experimentation is carried forward, the teachers themselves develop more understanding and appreciation of the values of science teaching.

Teachers in many local schools share in workshops, institutes and conferences. They thus deepen their own understanding of modern science and are helped to develop appropriate teaching materials and activities. The National Science Foundation, through its institute programs in co-operation with colleges and universities, has made it possible for many teachers throughout the United States to improve their backgrounds in science.

These impressive changes in basic teaching of science are by no means an accomplished fact in all American schools. Old ways of viewing and doing things hang on in many places. However, as the significance of the recent advances in man's knowledge of the world and the universe beyond is understood more widely, the clearer it becomes that changes in the basic teaching of science must be speeded up. Only in this way will young people learn to be effective and creative in contemporary life.

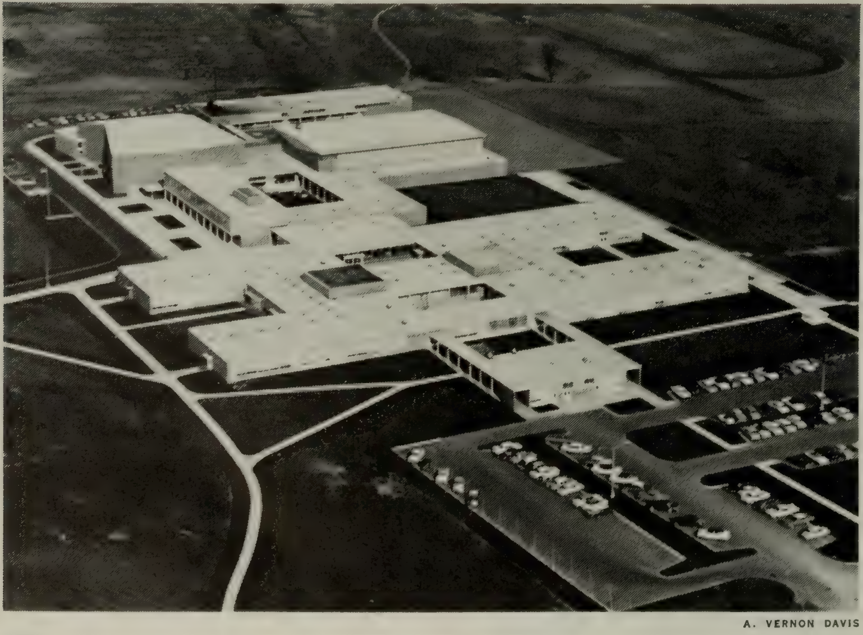
CAMPUS LAYOUT for HIGH SCHOOLS



HEDRICH-BLESSING

The outdoor auditorium at Proviso West High School in Hillside, Illinois, is sheltered by the school buildings and forms an integral part of the campus.

The North Hagerstown High School in Hagerstown, Maryland, houses its four grades in separate wings, but gymnasium, auditorium and so on are shared.

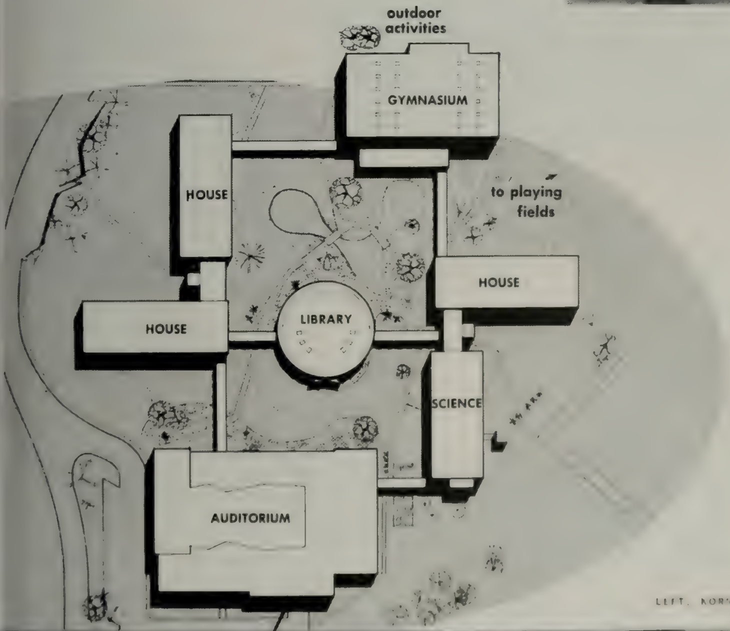


A. VERNON DAVIS

ONE of today's significant developments in the design of American high schools is the trend toward campus-planning. Instead of constructing one huge building, educational designers are experimenting with schools made up of a number of smaller buildings linked together functionally. This makes for greater separation where that is needed and also for more concentration in communal school activities.

A condensed campus plan was adopted for the Wayland (Massachusetts) Senior High School. The circular building at the left is the domed field house of the school's Physical Education Center.

THE ARCHITECTS COLLABORATIVE



A plan of the Newton South High School, Newton, Massachusetts, is shown at left and, below, a model of the high school. The student body is divided among the three "houses," with about five hundred to each house.

LEFT, KORSLUND, LENORMAND & QUANN, ARCHITECTS
BELOW, PHOTOGRAPHER [illegible]

VERTICAL

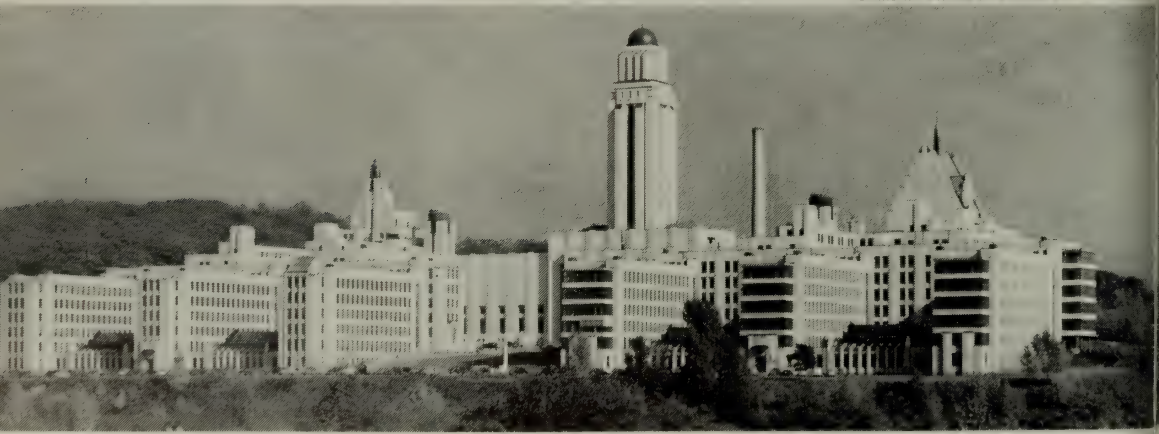
PHILIP GENDREAU

The University of Mexico is noted for its contemporary architecture.

MANY modern college buildings, planned both for dormitory living and classroom space, reflect widespread trends in the architecture of the mid-twentieth century. Massive piles of masonry with multi-windowed walls, they provide more space and light than did the older types of college buildings constructed years ago.

The towers of the University of Montreal uplift the massive pile.

CANADIAN NATIONAL RAILWAYS



CAMPUS

UNIVERSITY OF PENNSYLVANIA

Alfred Newton Richard Medical Research Building at the University of Pennsylvania features high brick towers that "breathe in" air from the nearby Botanical Gardens.

LONG ISLAND UNIVERSITY

Long Island University is located in Brooklyn.

WELTON BECKET & ASSOCIATES

Dykstra Hall, a University of California at Los Angeles men's residence hall, presents an imposing and severe face set in the lines of the new campus architecture.

The University of Miami in Florida houses 720 girls in this T-shaped residence hall seven stories high.

UNIVERSITY OF MIAMI

GROWING PAINS IN UNITED STATES EDUCATION

The increasing number of students is creating a serious problem in schools throughout the United States. At the end of World War II the number of veterans taking advantage of the GI Bill of Rights greatly taxed the facilities of colleges and universities. Today colleges are again forced to deal with an overwhelming number of applicants—"war babies" whose attendance in the lower grades made necessary such makeshift remedies as two school sessions a day. In the near future, educators must decide whether to expand facilities to meet the growing number of applicants to colleges and universities or to raise admission standards to limit the size of classes.

GROWING ENROLLMENT IN PUBLIC ELEMENTARY AND SECONDARY SCHOOLS

YEAR [1]	THROUGH GRADE 8	GRADE 9 AND ABOVE	TOTAL
1900	14,984,000	519,000	15,503,000
1910	16,899,000	915,000	17,814,000
1920	19,378,000	2,200,000	21,578,000
1930	21,279,000	4,399,000	25,678,000
1940	18,833,000	6,601,000	25,434,000
1950	19,387,000	5,725,000	25,112,000
1960	24,538,843	11,499,094	36,037,937
1961[2]	25,265,620	11,978,664	37,244,284

[1] Refers to end of school year.
[2] Estimated.

PERCENTAGE INCREASE IN ENROLLMENT—PUBLIC ELEMENTARY AND SECONDARY SCHOOLS FROM 1949–50 TO 1959–60

STATE	PER CENT	STATE	PER CENT	STATE	PER CENT
Alaska	182.4	New Jersey	49.6	South Dakota	29.2
Nevada	168.9	Louisiana	45.0	Vermont	25.8
Florida	129.9	New York	44.7	Pennsylvania	25.7
Arizona	119.1	Indiana	44.0	Maine	24.4
California	94.6	New Hampshire	42.8	Iowa	24.1
Maryland	74.0	Virginia	42.8	South Carolina	24.0
Delaware	68.8	New Mexico	42.6	North Carolina	23.2
Connecticut	68.5	Wisconsin	41.7	Tennessee	22.8
Washington	63.9	Minnesota	40.5	Nebraska	22.0
Colorado	63.6	Rhode Island	40.2	Oklahoma	21.2
Ohio	58.8	Montana	38.7	Alabama	16.2
Illinois	56.9	Kansas	38.4	North Dakota	15.5
Hawaii	56.4	Massachusetts	37.3	Kentucky	13.9
Michigan	52.3	Idaho	35.0	Mississippi	9.0
Utah	51.8	Wyoming	32.6	West Virginia	4.9
Oregon	51.3	Georgia	31.3	Arkansas	3.7
Texas	51.3	Missouri	29.7		

AVERAGE INCREASE FOR FIFTY STATES AND THE DISTRICT OF COLUMBIA [1] 44.4 PER CENT

[1] Data were not available for the District of Columbia alone.

GROWING ENROLLMENT IN COLLEGES AND UNIVERSITIES

YEAR	PUBLIC	PRIVATE	TOTAL
1900	90,689	146,903	237,592
1910	166,560	188,655	355,215
1920	315,382	282,498	597,880
1930	532,647	568,090	1,100,737
1940	796,531	697,672	1,494,203
1950	1,354,902	1,304,119	2,659,021
1960 [1]	2,227,000	1,551,000	3,778,000
1965 [1]	3,011,000	1,849,000	4,860,000

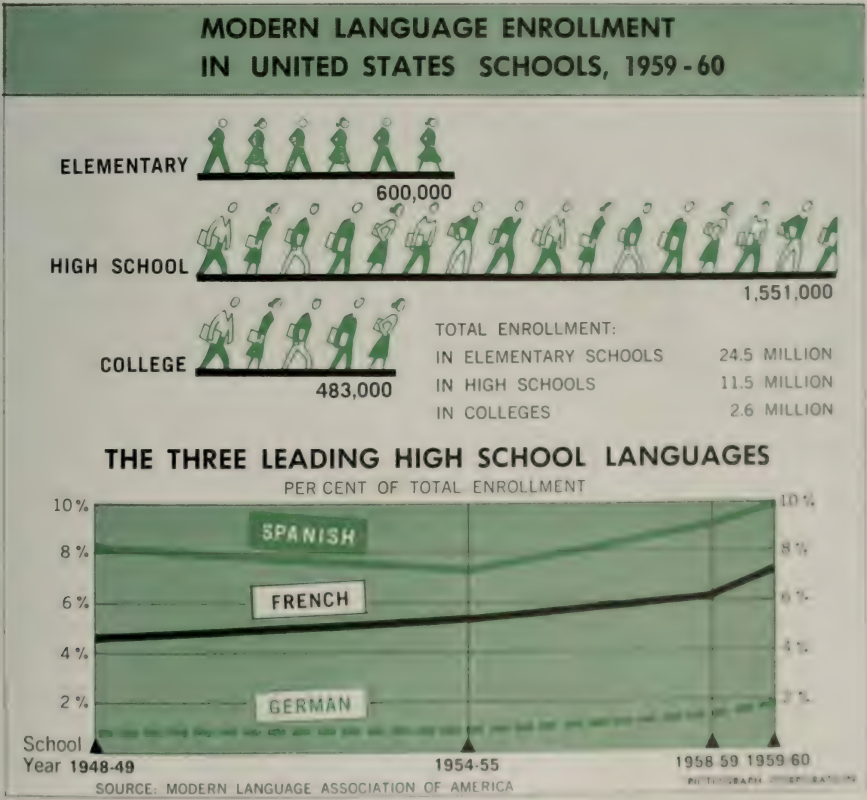
[1] Estimated.

TOTAL EDUCATIONAL BACKGROUND OF PEOPLE 25 YEARS OLD AND OVER

	1940		1960[1]		1980[1]	
YEARS OF SCHOOL COMPLETED	NUMBER OF PEOPLE	PER CENT OF POPULATION	NUMBER OF PEOPLE	PER CENT OF POPULATION	NUMBER OF PEOPLE	PER CENT OF POPULATION
Less than 5	10,105,000	13.7	8,026,000	8.1	5,356,000	4.1
5–7	13,656,000	18.5	13,169,000	13.3	10,078,000	7.7
8	20,757,000	28.2	17,310,000	17.5	12,718,000	9.7
9–11	11,182,000	15.2	18,701,000	18.9	27,132,000	20.7
12	10,552,000	14.3	26,147,000	26.4	48,702,000	37.2
13–15	4,075,000	5.5	8,167,000	8.2	13,164,000	10.1
16 or more	3,407,000	4.6	7,522,000	7.6	13,636,000	10.4
Number of people 25 years old and over	73,734,000		99,042,000		130,786,000	

[1] Estimated.

SOURCE, ALL TABLES: Research Division of the National Education Association



SOURCE: MODERN LANGUAGE ASSOCIATION OF AMERICA

STUDENT-EXCHANGE PROGRAMS

International understanding is greatly facilitated by the exchange of students among the countries of the world. The statistics given below and the thoughtful letters of appraisal on page 351 indicate the scope and success of the student-exchange program.

FIELDS OF INTEREST OF FOREIGN STUDENTS IN THE UNITED STATES, SCHOOL YEAR 1959–60

Number of students tabulated by region of origin and field of study

	Far East	Latin America	Middle East	Europe	North America [1]	Africa	Oceania	Other [2]	TOTAL
Engineering	3,642	2,520	2,691	1,132	938	269	53	34	11,279
Humanities	2,706	2,050	863	1,644	1,517	302	139	25	9,246
Natural and physical sciences	3,344	889	924	962	737	297	107	16	7,276
Social sciences	2,838	827	849	1,048	728	399	82	11	6,782
Business administration	1,549	853	403	495	621	150	41	2	4,114
Medical sciences	1,236	738	471	466	508	181	64	21	3,685
Education	866	403	302	223	484	156	46	3	2,483
Agriculture	410	492	326	161	96	98	29	3	1,615
Unknown	466	409	248	202	95	90	6	8	1,524
All other	118	247	33	29	37	17	1	0	482
TOTAL	17,175	9,428	7,110	6,362	5,761	1,959	568	123	48,486

[1] Includes Canada and Bermuda only.
[2] Includes thirty students from the Soviet Union.

COUNTRIES WITH THE GREATEST NUMBER OF PERSONS STUDYING IN THE UNITED STATES, SCHOOL YEAR 1959–60

Number of students and academic status

	NUMBER	UNDERGRADUATES	GRADUATES	SPECIAL STUDENTS	UNKNOWN
CANADA	5,679	3,564	1,836	206	73
TAIWAN [1]	4,546	2,041	2,275	138	92
INDIA	3,772	840	2,520	314	98
IRAN	2,507	1,924	392	104	87
KOREA	2,474	1,124	1,106	201	43
JAPAN	2,168	849	1,129	141	49
PHILIPPINES	1,722	502	1,049	131	40
MEXICO	1,356	1,069	208	54	25
VENEZUELA	1,126	881	141	73	28
GREECE	1,095	710	302	46	37

[1] Includes students from China, Hong Kong and Macao.

UNITED STATES STUDENTS AND FACULTY MEMBERS STUDYING OR TEACHING ABROAD[1]

AREA	NUMBER	AREA	NUMBER
EUROPE	10,452	OCEANIA	95
NORTH AMERICA [2]	1,695	AFRICA	86
LATIN AMERICA	1,485	SOVIET UNION	37
FAR EAST	1,120	ANTARCTICA	1
MIDDLE EAST	416	OTHER AREAS	42

TOTAL 15,429

[1] Figures for faculty members are for the school year 1959–60; figures for students are for the school year 1958–59.
[2] Includes Canada and Bermuda only.

SOURCE, ALL TABLES: Institute of International Education

PATRICIA E. ANDREW, chemistry, American student in Germany:

AS a student of German interested in becoming a translator of German literature, it was natural that I should want to go to Germany itself to learn the language. A translator must be familiar not only with the literary, cultural and economic development of the country whose language he intends to translate, but he must be able to recognize as well the current trends existing in that culture and therefore in its language. For these reasons I chose to apply for a grant to Berlin.

Despite its insular position, cut off from the Federal Republic and set deep within Communist Germany, Berlin remains in many respects the center of intellectual and cultural life for both West and East Germany. Perhaps this very position, in which both East and West Berlin compete with one another in theatrical, musical and other events, has contributed to the tremendous vitality of the city. For the student who, within a matter of minutes by subway, can leave one sector and enter the other, the opportunity to understand modern divided Germany is unique: the functional architecture in the Western sector, to suggest material well-being, and the pompous façade display of the totalitarian East, with its immense squares for marching and parades; the Schiller theater in the West and Bertolt Brecht's communist theater in the East; luxuriously colorful Western shop windows, and the unrelieved drabness of stores in East Berlin; Western neon advertisements on the streets, Eastern political banners hung from buildings; the comparative book displays in the two sectors. Berlin is a juncture of Eastern and Western ways of life and affords a provocative study for the American student entering a world in which he will play an ever increasing role. Extending far beyond each student's individual field, the very opportunity to study in such a city suggests the possible fuller implications inherent in the international student-exchange program.

HOLGER ENGBERG, economics, Danish student in the United States:

THE United States has gradually achieved the same position in international education as that maintained by Great Britain for generations. The mutual benefits of the student-exchange programs are obvious: the foreign student becomes thoroughly acquainted with the many facets of American life, which is in itself the best way of eliminating prejudices; he is exposed to academic standards that are frequently higher than those of his home country; and he is given the opportunity of specializing to a greater extent than is possible in most other countries. To the American institutions the foreign students often bring fresh ideas and a different kind of human qualities that are widely appreciated by American faculty members and student friends alike.

Exchange students are also faced with many problems, however. Lack of proficiency in English may be a serious barrier, and the sharp academic competition among American top students frequently surprises the less well-prepared foreign student. Teaching methods may differ considerably from those abroad, being more exact in details and more demanding on persons who have not been trained along these lines. Moreover, many European students —accustomed to a more relaxed academic atmosphere which traditionally characterizes their home universities—have been frustrated by the prearranged and prefixed study programs of American colleges which leave little room for reliance upon individual potentials to absorb learning and to expand intellectual capacity.

DONALD A. KINNEY, law, American student in England:

FOREIGN study is basically a continuation of formal education begun in the United States. However, in an international community, such as is the University of London, I found that extracurricular discussion and informal gatherings of students give a broader scope to the educational value of studying abroad. The confrontation of the nationals of many countries in and out of the classroom engenders a comparison of ideas and institutions that benefits from the divergent points of view expressed. A debate in an international law class on the influence of Wall Street on American foreign policy; a forum before an audience composed primarily of Africans on the future of parliamentary democracy in Africa; a discussion of national interests with a group of Asian students—these are a few of my experiences in England.

Let me add, for the sake of balance, that there seemed to be ample time and willing companions for parties, sports or other diversions.

JOSEPH M. MUBIRU, economics, Ugandan student in the United States:

PERHAPS the greatest challenge to the exchange student is the part he can play in closing the psychological barrier that often separates one people from another. His accomplishment depends on his ability to understand other people and to help them to understand his own people better. In doing this he may perhaps help others to realize that what is common to them is more advantageous to them all than the excitement over what divides them.

I was happy to participate in an international seminar arranged by the Institute of World Affairs, which was held at Twin Lakes, Salisbury, Connecticut, in the summer of 1960. For this program about forty undergraduates, graduates and upperclassmen were drawn from various religious, social and racial backgrounds, representing nineteen countries. They were chosen carefully for qualities of leadership, intelligence, character and ability to get on with others, and participated in a serious attempt to understand other peoples' ideas, cultures and aspirations. The topic of the seminar was: "World Peace in the World of Conflict."

Here was an opportunity for individual growth through group experience and for listening to some of the best speakers in the United States. Through the interactions of the participants, we realized what I would call the true educational process. To have contributed in my humble way to this project, seeking to establish world brotherhood and understanding, was my crowning satisfaction.

D.Gibbons

SHOW BUSINESS

MOTION PICTURES

The Film Year in Review
Moira Walsh 354
The World of Ingmar Bergman
Arthur Knight 359

TELEVISION AND RADIO

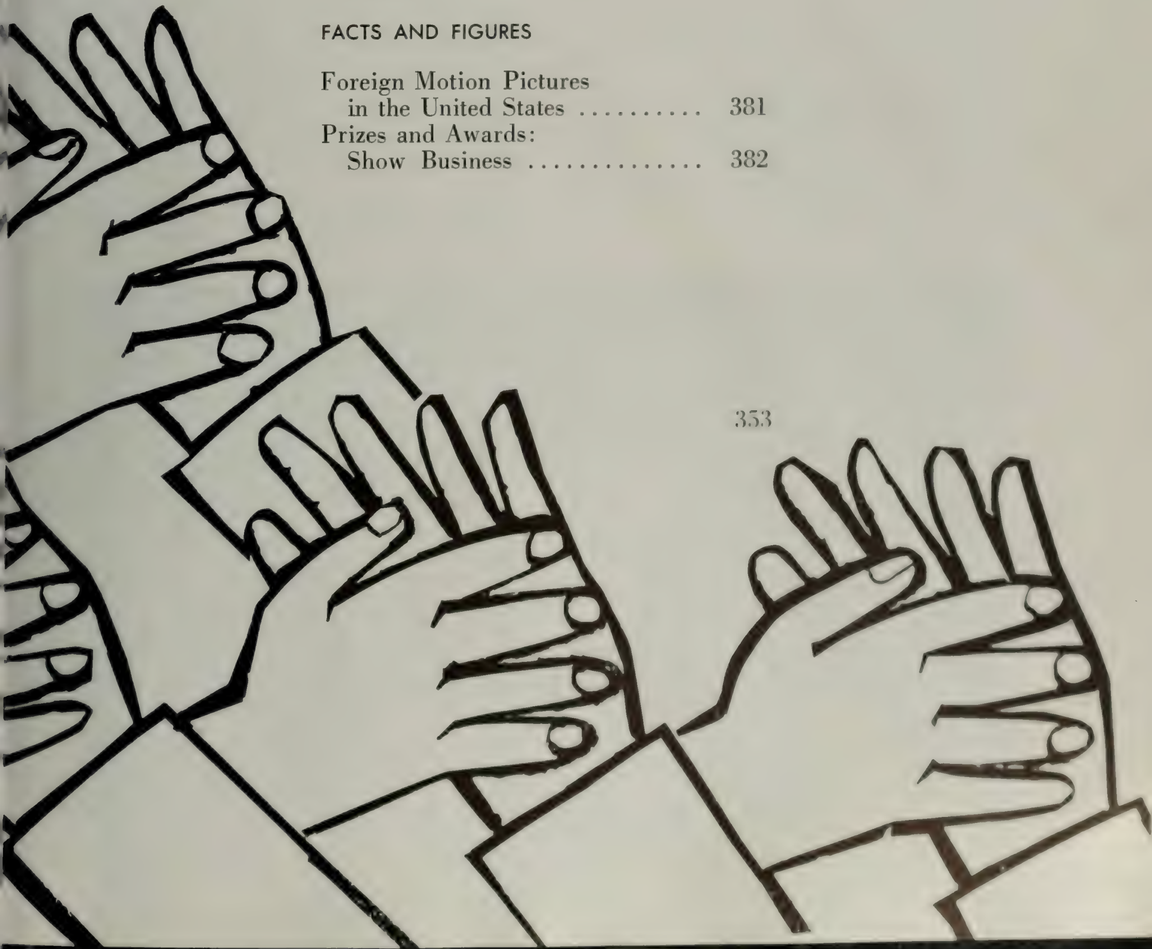
Review of TV and Radio
Clarence G. Petersen 362
Pay TV
Jack Gould 369

THEATER

On Stage!
Lane Mandry 373
Economics of the Theater
Judith Crist 377

FACTS AND FIGURES

Foreign Motion Pictures
in the United States 381
Prizes and Awards:
Show Business 382



The Film Year in Review

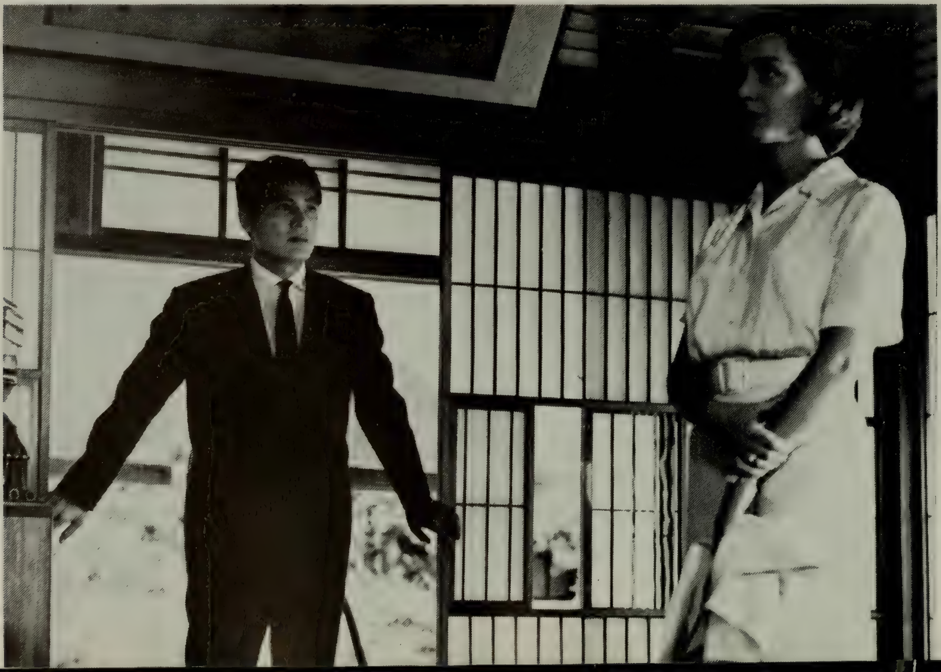
By MOIRA WALSH

Motion-Picture Critic, AMERICA

THE year 1960 opened on a note of optimism throughout the motion-picture industry. This optimism was based on one studio's colossal gamble which had paid off handsomely. The company was MGM and the gamble consisted in sinking about $15,000,000 into the making of *Ben-Hur*, which opened late in 1959. This wide-screen spectacle met with almost unprecedented approval from both the critics and the public. Toward the end of 1960 it was still playing to packed houses on a two-a-day "hard-ticket" basis. The end of its run, whenever that comes, may find it the highest-grossing film in screen history. The advent of such a popular film is not only profitable for the company that made it, but it also generates additional business for the pictures made by other companies. It was probably *Ben-Hur's* financial and public-relations contribution to the industry, as much as its superiority to most Biblical epics, that caused it to receive the record-breaking number of eleven Academy awards.

Ben-Hur set a dangerous precedent, however. It encouraged too many producers to chase the astronomical profits that theoretically can be garnered from the over-length, multimillion-dollar spectacle. In actual practice, pictures as successful financially as *Ben-Hur* are almost as hard to find as the pot of gold at the end of the rainbow. But the fall of 1960 witnessed the opening of two historical epics, each with an announced budget of $12,000,000. *The Alamo*, produced by John Wayne and starring Wayne, Richard Widmark and Laurence Harvey, re-enacted a heroic chapter in American history. *Spartacus*, also produced by one of its stars, Kirk Douglas, featured in addition such excellent performers as Laurence Olivier, Charles Laughton, Jean Simmons, Peter Ustinov and Tony Curtis. It dealt with the revolt of slaves led by a gladiator named Spartacus against their cruel and decadent Roman masters in approximately 70 B.C. For the motion-picture industry, the year that had begun so

ZENITH INT.



Eiji Okada and Emmanuelle Riva in *Hiroshima, Mon Amour*, a foreign film hailed as a masterpiece.

optimistically ended on a note of uncertainty concerning huge financial gambles of this kind. Even so, the trend toward "big" pictures to be exhibited at theater prices on a two-a-day basis continued. No less than fourteen films were being planned or were already in production late in 1960 that were expected to appear as "road-show" attractions in 1961.

The most conventional type of spectacle, based more or less loosely on stories from the Bible, was represented in 1960 by two films. *The Story of Ruth*, with Stuart Whitman and Israeli actress Elana Eden, was serious and dignified in approach. *Solomon and Sheba*, starring Yul Brynner and Gina Lollobrigida, was more notable for lurid details than pious sentiment.

Many problems that had been developing within the industry over the years became acute in 1960. A number of them had to do with the decline of the major studios as makers of industry policy; this resulted from the phenomenal growth of independent production. Whatever their faults, the major studios were at least stable and responsible toward the public. They were also the chief agency for the discovery and gradual development of new talent. Now they are little more than landlords renting sound stages to independent producers, and business agents distributing the finished products. One obvious result of this change-over is that almost no new talent is being developed. Consequently, the select group of established stars can demand an almost prohibitively high price for their services. The once orderly and predictable film market place has become an arena of cutthroat competition and chaos.

The reduced role of the major studios has also left Hollywood without spokesmen with the authority to set policy for the industry. Such spokesmen are urgently needed to handle a crisis developing over the production of more and more so-called "adult" films. Hollywood has been criticized in the past for its failure to tackle the serious problems of life, but in the last few years it has made a number of movies with mature subject matter. Some of these have been excellent, but too many of them seem to have been made with little thought about their being suitable for today's largely youthful mass audience.

The year produced a bumper crop of "adult" films, made with widely varying degrees of artistry and seriousness of purpose. They were all, however, characterized by an outspokenness on the seamier aspects of life that would have been unthinkable a few years ago. Prominent among them were: film versions of Tennessee Williams' plays *Suddenly Last Summer* (Elizabeth Taylor, Montgomery Clift and Katharine Hepburn) and *The Fugitive Kind* (Marlon Brando, Anna Magnani and Joanne Woodward); adaptations of two John O'Hara novels, *From the Terrace* (Paul Newman and Joanne Woodward) and *Butterfield 8* (Elizabeth Taylor and Laurence Harvey); two pictures made from controversial novels of a generation ago, Sinclair Lewis' *Elmer*

COLUMBIA PICTURES

Kerwin Matthews dips fish from the sea with his hat in the title role of *The Three Worlds of Gulliver.*

Gantry (Burt Lancaster and Jean Simmons) and D. H. Lawrence's *Sons and Lovers* (Dean Stockwell, Wendy Hiller and Trevor Howard); and adaptations of two recent best sellers, *The Bramble Bush* (Richard Burton and Barbara Rush) and *Strangers When We Meet* (Kirk Douglas and Kim Novak). *Psycho* (Anthony Perkins and Janet Leigh), Alfred Hitchcock's shocker about murder and abnormal psychology, also belongs in this group. So do Billy Wilder's satiric comedy-drama *The Apartment* (Jack Lemmon, Shirley MacLaine and Fred MacMurray) and *Crack in the Mirror* (Orson Welles, Juliette Greco and Bradford Dillman)—Darryl F. Zanuck's melodrama of crime and retribution in upper- and lower-class Paris.

As the year progressed, there was increasing protest over this "adult" type of film, from exhibitors and civic and religious groups, as well as some agitation for government censorship. Under the old setup, the studios would have taken appropriate, concerted action to meet this threat to the well-being of the industry, but they no longer have the authority to do so. If this situation is allowed to continue until outside agencies intervene, the genuine gains that films have achieved in the way of greater freedom and maturity may be wiped out, along with the abuses.

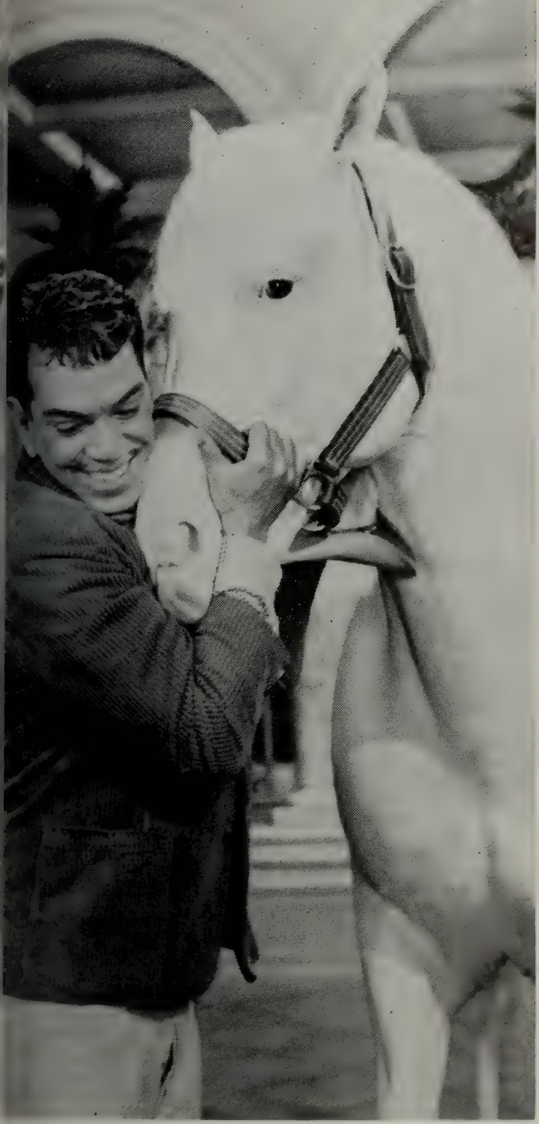
Another serious setback encountered by Hollywood in 1960 was strikes by the Writers Guild of America, lasting from January to June, and by the Screen Actors Guild, which halted domestic production altogether from March 7 to April 8. One of the issues was the demand by both guilds for a share of any payments received by the companies for the sale of post-1948 films to television. When the guilds accepted a new contract that did not provide for this payment, the way was open for the major studios to sell these films. Warners and 20th Century-Fox sold to TV in multimillion-dollar deals large blocks of their comparatively recent output, and Columbia was reported to be negotiating a similar arrangement. Feature movies on TV offer powerful direct competition to current films on view in the theaters and it may well be that the profits obtained from such sales are more than canceled out by the loss of future box-office receipts.

To supplement the perilously short supply of domestic films (caused by the strikes) an unusually large group of British films was shown in the United States in 1960. Of these, only *Sink the Bismarck*, a semidocumentary account of a World War II sea battle, gave a good account of itself at the box office. There were other worthwhile films in the group, however. *Conspiracy of Hearts*, with Lilli Palmer, was the moving story of Italian nuns saving Jewish orphans during World War II. *Flame over India*, starring Kenneth More and Lauren Bacall, was an exciting tale of adventure on the Indian frontier. Of these British films, some had "adult" themes. *Expresso Bongo*, with Laurence Harvey, and *The Entertainer*, starring Laurence Olivier, were satiric examinations of the seedier side of London's theatrical world.

England also exported a number of pungent, self-satirizing comedies such as those in which Alec Guinness used to appear. These included: *I'm All Right, Jack; The Battle of the Sexes; The Bridal Path; School for Scoundrels;* and *Man in A Cocked Hat.* Several of them starred Peter Sellers, often described as a young Guinness.

WARNER BROS.

The stricken Franklin D. Roosevelt (Ralph Bellamy) pores over his stamps in *Sunrise at Campobello.*



Cantinflas, the gifted Mexican comedian, acts as groom to a white stallion in *Pepe*. Its cast included a galaxy of film stars playing themselves.

COLUMBIA PICTURES

About the usual quota of foreign-language films was imported, and more of them than ever were dubbed into English to achieve wider circulation. Among the best were: *Black Orpheus; Hiroshima, Mon Amour;* and *Le Bourgeois Gentilhomme,* from France. From Germany came *Rosemary* and *The Rest Is Silence;* from Sweden, *Dreams* and *A Lesson in Love;* from Greece, *Never on Sunday;* from India, *The World of Apu;* and from Japan, *Ikiru*. Under the terms of a cultural exchange program with the Soviet Union, several Russian films were shown in the United States, including *The Idiot, And Quiet Flows the Don* and *Othello.*

With all the problems besetting the motion-picture industry, the wonder is that it turned out as many pictures as it did. Another wonder is that business continued to hold up reasonably well. The greatest wonder of all is that the quality of films continues to rise. It is immeasurably higher today than it was in the pre-television Hollywood of full production and prosperity.

The year saw a number of distinguished, good and almost-good films. Prominent among the dramas were Stanley Kramer's *Inherit the Wind* (Spencer Tracy and Fredric March), based on the famous Scopes evolution trial, and Elia Kazan's *Wild River* (Montgomery Clift and Lee Remick). about the human dislocations as well as the material progress caused by the TVA projects. *The Dark at the Top of the Stairs* (Robert Preston and Dorothy McGuire) and *Home from the Hill* (Robert Mitchum and Eleanor Parker) probed troubled family life. *The Wreck of the Mary Deare* (Gary Cooper and Charlton Heston) and *The Last Voyage* (Robert Stack and Dorothy Malone) were rousing sea stories. Almost perfect crimes were examined sardonically in *Seven Thieves* (Rod Steiger and Edward G. Robinson) and *Ocean's 11* (Frank Sinatra and Dean Martin). *Portrait in Black* (Lana Turner and Anthony Quinn) was a glamour-heavy but unconvincing suspense melodrama, while *Midnight Lace* (Doris Day and Rex Harrison) was a defter and more light-handed mystery story with an equally glamorous setting. Comedy and drama were also combined in *Our Man in Havana* (Alec Guinness and Noel Coward).

Good comedies were less plentiful. *Please Don't Eat the Daisies* (Doris Day and David Niven) was a popular but rather saccharine appreciation of family togetherness. *Operation Petticoat* (Cary Grant. Tony Curtis and a shocking-pink submarine) and *Wake Me When It's Over* had military backgrounds. *Once More with Feeling* (Yul Brynner and Kay Kendall), about an eccentric symphony conductor; *The Gazebo* (Glenn Ford and Debbie Reynolds), about an inept murder attempt; *Who Was That Lady?* (Tony Curtis, Dean Martin and Janet Leigh), about marital friction and spies; and *Surprise Package* (Yul Brynner and Mitzi Gaynor), about a deported racketeer, were broadly farcical. *It Started in Naples* (Clark Gable and Sophia Loren) had beautiful scenery and poked good-natured fun at Italian-American differences. Anthony Perkins and Jane Fonda went to college in *Tall Story*, and Bing Crosby was a freshman in *High Time*, along with Fabian and Tuesday Weld.

The only big musical of the year was *Can-Can*, with a Cole Porter score, a Todd-AO re-creation of turn-of-the-century Montmartre, and Frank Sinatra, Shirley MacLaine, Maurice Chevalier and Louis Jourdan. *Bells Are Ringing* starred Judy Holliday as an emotionally involved telephone-answering-service operator. Marilyn Monroe played an off-Broadway actress and Yves Montand a billionaire in *Let's Make Love*. *Li'l Abner*, a musical adapted from a play based on the comic strip, was cruder and less satiric than the original. *Song without End*, a musical biography of Franz Liszt, with Dirk Bogarde and Capucine, was far from accurate, yet had considerable stature and even more eye and ear appeal.

Nonmusical biographical films included *Sunrise at Campobello*, with Ralph Bellamy as Franklin D. Roosevelt and Greer Garson as his wife. *I Aim at the Stars* was about the controversial rocket scientist Wernher von Braun (Curt Jurgens). *The Gallant Hours* was a moving semidocumentary of the ordeal of Admiral Halsey (James Cagney) at a low point in American fortunes during World War II.

Other war films with factual backgrounds were *Hell to Eternity* (Jeffrey Hunter) and *Under Ten Flags* (Van Heflin). Fictional but graphic accounts of war were given by: *Never So Few* (Frank Sinatra and Gina Lollobrigida), about guerrilla warfare in World War II Burma; *The Mountain Road*, about an Allied retreat in China, with James Stewart; and *All the Young Men*, about a lost patrol in Korea, with Alan Ladd and Sidney Poitier.

Westerns, once a staple film item, are now almost entirely the prerogative of TV. The year did, however, produce two large-scale Western dramas—*The Unforgiven*, with Burt Lancaster and Audrey Hepburn, and *Sergeant Rutledge*, with Jeffrey Hunter and Constance Towers; and a burlesque Western, *Heller in Pink Tights*, with Anthony Quinn and Sophia Loren. A distinguished outdoor drama about the Australian frontier, *The Sundowners*, appeared with Deborah Kerr and Robert Mitchum.

Three classic novels in the science-fiction field were filmed: *Journey to the Center of the Earth*, by Jules Verne, with James Mason and Pat Boone; *The Lost World*, by Conan Doyle, with Michael Rennie and Claude Rains; and *The Time Machine*, by H. G. Wells, with Rod Taylor and Yvette Mimieux. In the field of horror movies, there was one good picture—an adaptation of Poe's *The Fall of the House of Usher*.

It is pleasant to be able to observe, finally, that the year that was criticized for producing too many "adult" movies also produced an unusually good selection of films especially suited for young people. Walt Disney brought out screen versions of three juvenile classics: *Toby Tyler*, with Kevin Corcoran; *Kidnapped*, with James MacArthur and Peter Finch; and *Pollyanna*, with Hayley Mills and Jane Wyman. Other movie makers with a youthful viewpoint came up with *1001 Arabian Nights* (cartoon); *A Dog of Flanders*, with David Ladd and Theodore Bikel; *The Adventures of Huckleberry Finn*, with Eddie Hodges and Archie Moore; and *The Three Worlds of Gulliver*, with Kerwin Matthews and June Thorburn. Disney's *The Jungle Cat* and *Masters of the Congo Jungle*, made by a Belgian scientific expedition, were documentaries of absorbing interest and lasting value.

The World of INGMAR BERGMAN

By ARTHUR KNIGHT

Film Critic
The Saturday Review

IN an astonishingly short time the name of Ingmar Bergman, the great Swedish motion-picture writer and director, has become almost as familiar in the United States as that of his alluring countrywoman, Ingrid Bergman, to whom he is not related. Bergman's pictures are intellectual, enigmatic, uncompromising and seemingly the opposite of everything that normally spells high box-office returns. They have met with huge success in the art houses and have even made their way into neighborhood theaters and drive-ins.

Bergman, a somewhat withdrawn man with a lean, intense face, was born on July 14, 1918, in the Swedish university town of Uppsala. His father was a stern and ambitious Lutheran vicar who disapproved of his son's interest in movies and the theater. Traces of his early influence can still be seen in some of the authoritarian characters that Bergman has invented for his films. One of the themes that runs through most of his pictures, man's relationship to God, undoubtedly dates back to his childhood. "The devil was an early acquaintance," he has said, "and I felt a child's need to give him concrete form." That need for concrete form has persisted from the magic-lantern and puppet shows that Bergman surreptitiously staged in his childhood to the personification of death in *The Seventh Seal* and the appearance of the devil himself in *The Devil's Eye*.

The Bergman family moved to Stockholm in 1924, where the father eventually became chaplain to the Swedish royal family and where young Ingmar saw his first film. From that moment on the movies—and soon the theater as well—became his dominant passion. In 1937 he entered Stockholm University, where he majored in literature; the academic life, however, held little attraction for him. For a time he ran a student dramatic group which achieved a measure of success. In 1940 he left school and for the next few years devoted himself to writing plays, most of which were not only unproduced but unproducible. His macabre sense of humor, added to his intense reaction against his conventional upbringing, turned him into an almost classic beatnik type. He hung around the theaters of Stockholm until finally his extraordinary talents gained recognition.

After a number of odd jobs with various amateur groups, Bergman, still in his early twenties, was accepted as an assistant director at the Royal Opera in Stockholm. Before long, he was a full-fledged director in the legitimate theater and well on the way toward building a solid reputation as an imaginative, resourceful, creative artist. Despite his subsequent success in the motion-picture industry, he has continued to alternate between the stage and screen. He directs in the theater during the winter (first at Halsingborg, then at Goteborg and at Malmo) and shoots his films in the summertime.

In 1944 Bergman met Carl Anders Dymling, the head of Svensk-Filmindustri, the oldest and largest of the Swedish film companies. Dymling, a cultivated, far-sighted man, encouraged the youth to try his hand at the movies. (Since this was during World War II, the Swedish industry was more than ever forced to develop its own resources.) Within a few months, Bergman had completed his first script, *Hets*, a story based largely on the recollections and resentments of his own college days. Although it was brought to the screen by Alf Sjoberg, it was a notable start for Bergman's movie career. His scripts are so detailed and precise as to permit another director little leeway; and much that was originally praised as Sjoberg's can be seen today to have come completely from Bergman. *Hets* (shown in the United States as *Torment*) created an international sensation after the war, drawing critical attention to Sweden as a film-producing nation for the first time in a quarter-century.

Bergman directed his first picture, *Crisis,* in the following year, 1945. It is based, as are most of his films, on a script written by himself but adapted from a story by another author. It was not a success. Actually, despite a steadily growing recognition of both his film and his theater work, Bergman's real popularity in Sweden stems from the acclaim given him abroad following *The Seventh Seal, Wild Strawberries* and *The Magician.* His most successful pictures at home had been his comedies—*Waiting Women, A Lesson in Love* and *Smiles of a Summer Night.* Curiously, it was the serious pictures that established Bergman with American audiences, while the earlier comedies are only now making their way across the ocean.

For Bergman, tragedy and comedy seem inextricably intertwined, as are the twin masks of the Greek theater. Both are used by him to advance his two basic themes: man in his relationship to God and to woman. In the comic *Smiles of a Summer Night,* for example, a young divinity student is driven to attempt suicide by the worldliness of his friends; in the overwhelmingly serious *The Seventh Seal,* it is the deceivingly simple clown who ultimately finds salvation. In *The Magician,* comedy and tragedy are so thoroughly fused that some critics have accused Bergman of perpetrating a gigantic hoax, a fascinating but meaningless virtuoso display. Others, despite the film's sequences of low comedy and high farce, find it a moving testament of Christian faith with its central character a personification of Jesus Himself.

Bergman prefers not to explain—not only to his audiences but even to his actors. His greatest strength is his ability to conceive a theme, a story, an incident, completely in terms of the camera, and then to let the picture itself make his highly personal statement. He is aided in this by a group of sympathetic players—Gunnar Bjornstrand, Max von Sydow, Bibi Andersson, Ingrid Thulin, Eva Dahlbeck—who virtually constitute a Bergman stock company. Miss Thulin has said that often the actors must play their scenes to Bergman's specifications without the vaguest idea of their meaning in

SVENSK FILM, COURTESY OF "NEWSWEEK"

Director Ingmar Bergman, left, studies a scene at his studios in Sweden. Right, in Bergman's mystical allegory *The Seventh Seal* the innocent clown Joseph juggles for his wife Mary in an idyllic pastoral setting.

his over-all plan. And, she has said also, he can be almost cruel in driving his actors and crew until they have achieved the precise shadings of expression, lighting and tempo that he has envisioned.

If Bergman drives his company, he is no less sparing of himself. According to one observer, he combines "the zeal of a missionary with the vision of an artist." He writes and rewrites his scripts until they are as close to perfection as he can make them; then he shoots with incredible speed—generally only four rehearsals and three "takes" for every shot in his pictures. In the editing room he is ruthless, trimming each scene to the bone, eliminating everything that does not contribute its full weight to the accumulating effect. Once a production has been completed, he is so drained of energy that he invariably goes off to a sanitarium for the next three weeks—and not infrequently emerges with the idea, or even the script, for a new film or play.

Probably more than any director now working, Bergman tends to identify himself with the motion-picture camera. "I start to think over the next scene," he has said, "and I begin to feel it churning inside me. Suddenly a machine is turning over and I'm not tired any more." Holding up his fingers before his eyes in the form of an open rectangle, he remarks, "My hands are the limits, and I see the picture composed between them. When I have been working for fifteen days on the set, I no longer have a separate entity. By then I have become a functioning part of the camera." It is this unique approach, this sense of discovery through the camera lens, that makes even the most difficult and obscure Bergman picture exciting to moviegoers throughout the world. It is the director himself who remains the true star of his films.

Recently Bergman deviated from his normal reticence and wrote an article that was less an exposition of his techniques than a statement of his artistic credo. He concluded it with his own basic commandments:

Thou shalt be entertaining at all times.

Thou shalt obey thy artistic conscience at all times.

Thou shalt make each film as if it were thy last.

These commandments, he believes, can best be obeyed in the ancient, ill-equipped studios of Sweden, where producers give him his artistic head and respect his artistic conscience. He has resisted the blandishments of Hollywood, although he continues to divide his affections between the stage and screen. Early in 1960 he was appointed director of the Royal Dramatic Theater in Stockholm, considered one of the finest repertory companies in all of Europe.

JANUS FILMS

Review of TV and Radio

By CLARENCE G. PETERSEN
Assistant TV-Radio Editor
THE CHICAGO TRIBUNE

AS broadcasting entered the year 1960, the heat generated by disclosures of quiz-rigging and payola in 1959 had cooled somewhat. Broadcasting scandals were still in the headlines, but those headlines were smaller, less frequent and harder to find. Within the industry, however, apprehension continued to grow. The leaders, who had failed in their promise to bring forth a "new image" in 1959, were determined to define and project it in 1960. Many believed that unless this new image could be achieved, government regulation would be swift and comprehensive. By the end of 1960 there had been some regulatory legislation and some re-evaluation but little genuine progress toward the new image.

The presidential elections had provided broadcasting with a stay of execution and the opportunity to make even bigger news—in fact, to make history. This was the year of the Great Debates.

Broadcasters are still arguing over who it was who first thought of televising face-to-face discussions between the two major-party candidates for the presidency. The plan caught fire at the close of the Republican national convention in July, when the three major networks, the American and National Broadcasting companies and the Columbia Broadcasting System, invited Senator John F. Kennedy, the Democratic candidate, and Vice-President Richard M. Nixon, the G.O.P. candidate, to participate.

Before the debates could become a reality, Congress had to modify article 315 of the Federal Communications Act, which required radio and television stations to accord equal air time to all political contenders. To be effective the debates would have to be limited to the major-party candidates. The equal-time provision had caused trouble in 1959 when the Federal Communications Commission ruled that it applied to newscasts. President Eisenhower had termed the ruling "ridiculous," and newscasts were exempted from the provision. This, added to popular support for the debates, resulted in suspension of the entire provision in the post-convention Congressional session in August 1960.

With rules formulated by representatives of the two candidates, one-hour debates were held on September 26 and October 7, 13 and 21. The rules provided that the candidates be questioned by panels of newsmen representing the broadcasting and publications media. Each candidate was allowed two and one-half minutes to answer a question and one and one-half minutes to comment on the other candidate's answer.

The ground rules were a disappointment to many, especially the broadcasters, who would have preferred the traditional form of debate, with the candidates questioning each other. Still, they were the shows of the year, watched by an estimated 74,000,000 Americans. They were also generally recognized as a valuable contribution to the electoral process. *The Baltimore Sun*, in an editorial after the first debate, summed it up in this way: "The 'great debate' wasn't exactly great and it wasn't exactly a debate, but it was the best political program of the year." *The St. Louis Post-Dispatch* added: "The surprising thing was that a real discussion of the issues did take place, a real division on principle did begin to take shape."

The importance of the debates on the outcome of the election may never be fully understood. Informal surveys after

"THE NEW YORK TIMES"

On a controversial Open End program, producer David Susskind interviewed Nikita Khrushchev during the Premier's visit to the UN.

each encounter indicated that viewers better understood the issues and the candidates, but had not generally changed their minds about the candidate they would vote for. On the other hand, defense of the Nationalist Chinese islands, Quemoy and Matsu, became a leading campaign issue as a direct result of the second debate, whereas it might otherwise never have become an issue at all.

The national debates inspired some local copies but by no means as many as there might have been. Most office holders refused to share with their opponents the exclusive platform available to them by virtue of their incumbency. Vice-President Nixon's having agreed to the debates was widely regarded as a strategic error. This, and the belief that it might be undignified for a President of the United States to debate with a challenger, opened to question whether there would even be debates of this kind in 1964.

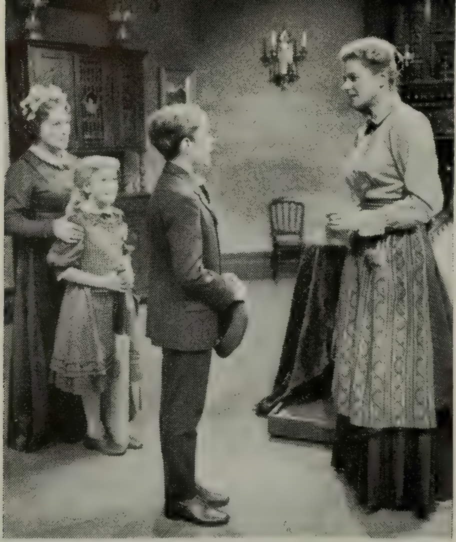
But the debates came relatively late in the year. During the first nine months, broadcasters thought mainly about their own survival. Their problems were complicated by the death of Harold E. Fellows, respected president of the National Association of Broadcasters, and the resignation under fire of John C. Doerfer, chairman of the Federal Communications Commission, who had admitted to a Congressional committee that he had accepted favors from broadcasters.

An atmosphere of uncertainty hung over the thirty-eighth annual NAB convention, which opened in Chicago in April. Clair R. McCollough, chairman of the NAB policy committee, said in his keynote address, "It is time for intensive self-inspection." Donald H. McGannon, retiring chairman of the NAB television-code review board, added that broadcasting must continue to strive for improvement even after fear of government regulation has disappeared.

The new FCC chairman, Frederick W. Ford, addressed the second convention

WNTA

Donald Davis and Patricia Cutts in the television production of *Tiger at the Gates*, a play about the Trojan War by Jean Giraudoux.



NBC-TV

Ingrid Bergman as the governess in *The Turn of the Screw*, a dramatization of Henry James' eerie novel.

WIDE WORLD

Jack Paar announced dramatically that he was quitting his show—and then returned a few weeks later.

session and forecast Congressional legislation in August prohibiting repetition of quiz rigging and payola. He warned that unless broadcasters heeded widespread complaints of "excessive violence" in programs, such programs, too, might be subject to regulation. Most delegates left the convention still uncertain about the future.

Some viewers must have been reminded of Ford's warnings two and one-half months later when the Academy of Television Arts and Sciences conferred its annual Emmy awards. The Untouchables, a series about Capone-era gangsters that has been widely criticized for its violence, won four awards, more than any other show.

Twenty-three Emmys were presented in a nationwide telecast, nineteen fewer than in 1959, for which there was evidence that the public was grateful. Among the winners: Ingrid Bergman, for her TV debut in *The Turn of the Screw;* Sir Laurence Olivier, for his debut in *The Moon and Sixpence;* Art Carney, who had won three previous Emmys as a supporting player, for his VIP special; Jane Wyatt, for her role in the Father Knows Best series. Robert Stack of The Untouchables was named best actor to appear in a series.

Despite the reduction in the number of Emmys, the Sylvania awards were discontinued with the explanation that there were too many TV awards for any to be of significance. This seemed to leave only the Emmys and the Peabody awards until Prince Rainier III of Monaco invited twenty-two nations to participate in the First International Television Festival on November 14 in Monte Carlo.

Programing continued its paradoxical pattern of getting worse and better at the same time. Some evenings it was next to impossible to find anything on the channels but Westerns and whodunits. At the same time the better programs were better than ever.

In addition to praise for the Olivier, Bergman and Carney specials, universal acclaim greeted the American television debut of Alec Guinness in the comedy *The Wicked Scheme of Jebel Deeks.* Fred Astaire did Another Evening with Fred Astaire. Bing Crosby and Perry Como got together twice, the second show a vast improvement on the first. Greer Garson starred in the Shaw comedy *Captain Brassbound's Conversion.*

The year also saw the introduction by a New York station of Play of the Week, a series of classic two-hour dramas, each repeated nightly for a week. The series won a Peabody award and was syndicated in the summer, although most buyers used

NBC-TV

Alec Guinness made his American TV debut in a wry comedy, *The Wicked Scheme of Jebel Deeks.*

it only once a week. Great Music from Chicago, concerts by the Chicago Symphony Orchestra, also won a Peabody award and was syndicated. Leonard Bernstein's Youth Concerts with the New York Philharmonic Orchestra continued to thrive, as did the NBC operas.

Television made its greatest strides in news and public affairs. The most notable series were World Wide 60 on NBC, and CBS Reports, which included *Biography of a Cancer,* a step-by-step report of Dr. Thomas Dooley's cancer operation and his expressions of hope before and after.

ABC, which entered the documentary field in earnest only the year before, produced a report on peaceful uses of atomic energy that was both outstanding and unique—unique because it was produced not by the network news department but by ABC's Chicago station.

All three networks telecast the political conventions. The coverage was little changed from that of other years, principally because the conventions were little changed, but for the television industry it had significance. For the first time, NBC outpointed CBS in the convention-ratings race. Viewers seemed to prefer the light-veined, but still authoritative, commentary of NBC's Chet Huntley and David Brinkley to the more sober CBS commentary of Walter Cronkite and Edward R. Murrow. The networks improved their coverage of the post-convention campaigns, all scheduling ambitious weekly reports.

Ratings showed great popularity for hour-long action or adventure series with more than one hero. The multiple-hero format was found in 77 Sunset Strip, Hawaiian Eye, Bourbon Street Beat, Wagon Train and Maverick. Each had at least two actors taking turns as the principal. All except Bourbon Street Beat returned in the fall.

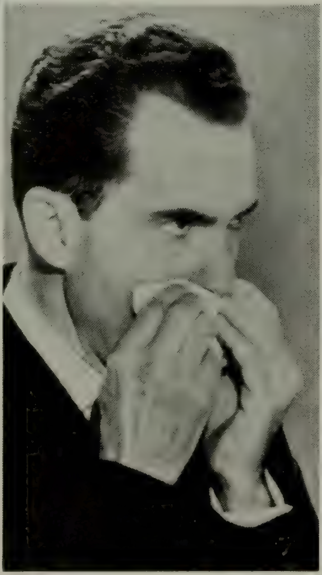
Comedy, which had declined sharply in the 1958–59 season, held the line in 1960. Besides the weekly Red Skelton show and the biweekly, alternating Jack Benny and George Gobel shows, viewers

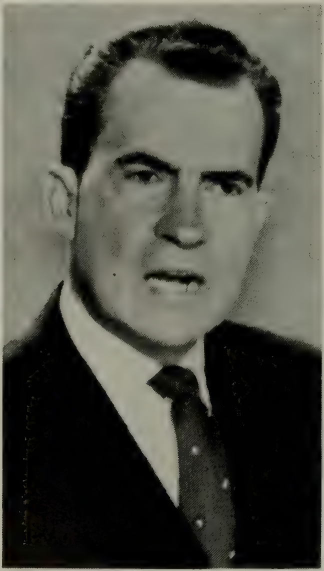
Howard K. Smith interviewing Dr. Tom Dooley on the CBS Reports documentary *Biography of a Cancer.*

CBS-TV

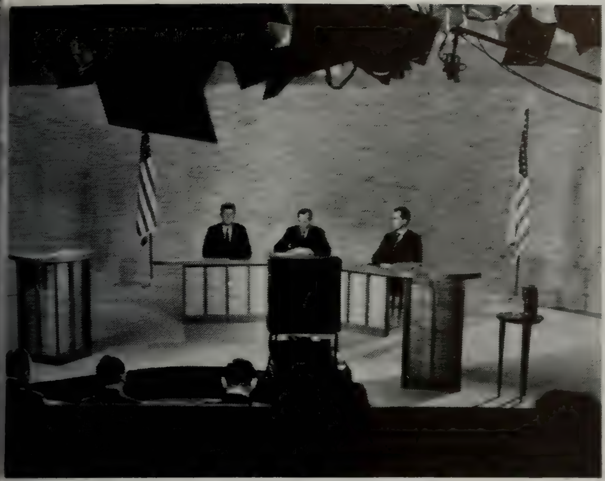
TELEVISION AND RADIO

The Great Debate





Millions of voters saw the four television discussions between presidential candidates Richard M. Nixon and



John F. Kennedy. Although used in previous campaigns, TV came of age as a political instrument in 1960.

ALL PHOTOS, WIDE WORLD

got most of their laughs from the situation comedies and variety shows. The latter continued to present the sophisticated humor of the "new comics"—Shelley Berman, Mort Sahl, Mike Nichols and Elaine May, Wayne and Schuster and the newest comer, Bob Newhart.

The big-money quiz shows vanished.

Then came the summer of reruns and reconsideration and with it the second biggest news of the television year—the Jack Paar walkout. Probably the biggest tempest ever to emerge from a TV teapot, the controversy started when NBC edited a joke, which the network believed was in "bad taste," from Paar's video-taped late-evening show. Paar said the next night that the network's action, taken without consulting him, was both rude and an abridgement of free speech. Close to tears, he left the show.

Paar's supporters, who immediately became known as "Paartisans," demanded in a deluge of mail that NBC apologize and ask Paar to return. Paar, meanwhile, vacationed in Hong Kong. Others, including the vast majority of TV critics, supported NBC's right and responsibility to decide what went over its channels. Such responsibility might have prevented the quiz and payola scandals, they argued.

Several weeks later Paar returned with the announcement: "When I left, I said there must be a better way to make a living. Well, I've looked, and there isn't."

The new season in September brought several changes in programing, none really productive of a new image. Instead of the four-hundred specials of 1959–60, which had been unprofitable, only a few dozen were planned for 1960–61. Half-hour situation comedies and one-hour adventure shows ended the supremacy of the Western. Eleven new situation comedies, including a cartoon version, brought the network total to seventeen, and thirteen new detective and adventure series brought that total to eighteen. Only three new Westerns were planned and several were dropped, making a total of twelve. The figures fail to show, however, that many of the adventure series were based on the classic formula of the Westerns, though new locales and eras provided the settings.

In other areas of television, programing continued as usual, although emphasis was further increased on public affairs.

A Federal Communications Commission report on radio-television advertising showed that it had been a profitable year. Total television billings were reported up 21.1 per cent, to $1,151,560,000. Total radio billings were up 12.5 per cent, to $609,114,000.

But radio was undergoing a change, as reflected in comparisons of network, national non-network and local billings. Network billings dropped 6.4 per cent, while local billings rose 10.8 per cent and national non-network billings rose 17.3 per cent.

Broadcasting stations continued to open. The latest census showed that there were 4,839 stations serving 46.5 million TV homes and 49.5 radio homes. This reflected the addition of 125 FM radio stations, 188 AM radio stations and 16 television stations.

Radio continued to adopt the very profitable music-news-sports formula. This was pointed up dramatically when CBS, at the behest of its affiliates, removed the last remaining network dramas from the air. These included such old favorites as Amos 'n Andy, Gunsmoke and Have Gun, Will Travel, and eight soap operas, among them the twenty-eight-year-old Helen Trent series.

Educational television, still hampered, especially at the local level, by insufficient financial resources, took compensatory steps in establishing the Learning Resources Institute. Its purpose: to supply tapes of school and college courses to supplement local efforts in that area and to complement programs of science, the humanities, art, drama and public affairs available through the national educational television network. In the Midwest educational telecasters were experimenting with transmission of programs to schools in a six-state area from an airplane flying at high altitudes.

PAY TV

By JACK GOULD

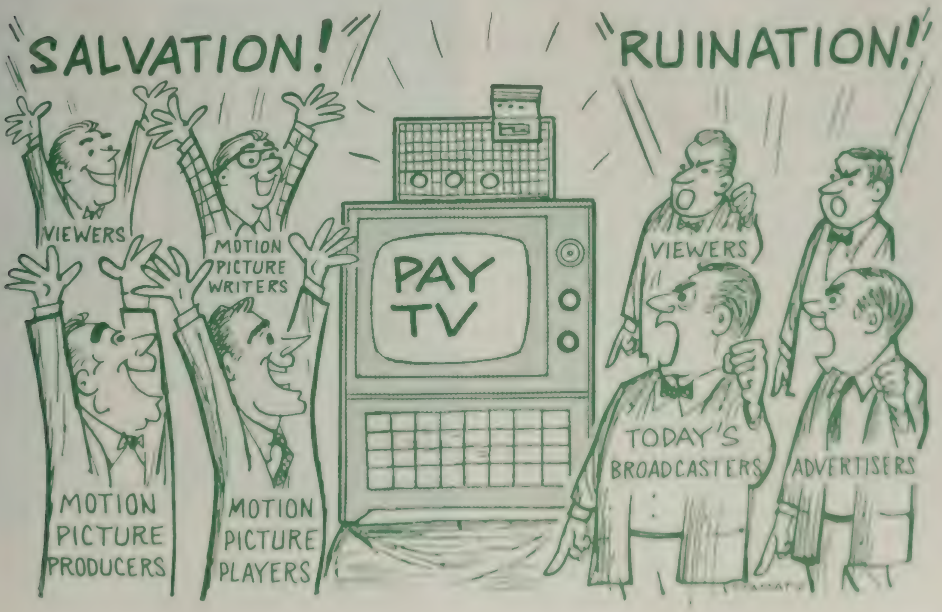
Radio-TV Critic
THE NEW YORK TIMES

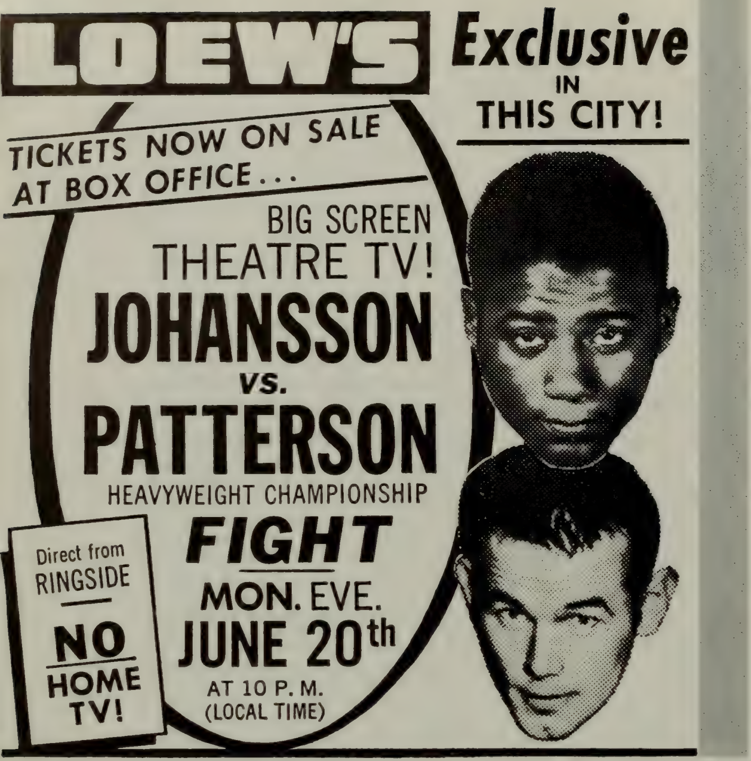
PAY-AS-YOU-SEE television is a system by which the television-set owner pays directly for the program that he watches. In effect, the system would revolutionize the method of financing the many shows that enter millions of homes throughout the world. Traditionally, broadcasting—first radio and then television—has been a service furnished free of charge, either by commercial sponsors anxious to advertise their products or by governmental agencies, such as the Canadian Broadcasting Corporation, using some form of tax revenue. Now it is proposed that the public pay for the entertainment that it receives on its television sets at home.

Toll television, as this type of system is also called, has probably provoked more sustained controversy than any other development in the evolution of video. It has been praised as a possible salvation of the home screen and it has been criticized as auguring its ruination. Indeed, there is only one point on which there is agreement: if pay TV comes into existence on a national scale in the United States, the entire realm of show business will experience another major upheaval. The repercussions will extend to advertising, education and many other phases of the country's social and economic existence.

How does pay TV work? The heart of a toll system is a gadget that will permit the collection of fees from millions of persons willing to pay for a show. At the same time, this gadget must make it impossible for anyone to see the program who is not willing to pay for it.

There are two principal ways of achieving this goal. The first is by means of wires that can be run directly from a central studio to thousands of individual homes in a town or city. Only slightly larger than the familiar telephone lines, these wires can be strung from pole to





LOEW'S Exclusive
IN
THIS CITY!

TICKETS NOW ON SALE
AT BOX OFFICE...

BIG SCREEN
THEATRE TV!
JOHANSSON
VS.
PATTERSON
HEAVYWEIGHT CHAMPIONSHIP
FIGHT
MON. EVE.
JUNE 20th
AT 10 P. M.
(LOCAL TIME)

Direct from
RINGSIDE
NO
HOME
TV!

Motion-picture theaters already have a form of pay television. Sports events, for instance, are sometimes shown only in theaters, for the price of admission.

pole along the streets and then connected directly to television sets. On one wire it is possible to send at the same time both the pictures and the accompanying sound for as many as three separate programs. This system is being tested by the International Telemeter Corporation, a subsidiary of Paramount Pictures Corporation, one of the major Hollywood film producers, in Etobicoke, a suburban community of Toronto, Ontario.

Telemeter, as the name implies, uses a coin-machine box with a slot for the insertion of coins. On one of the sound tracks, a viewer is told of the choice of programs on Channels A, B and C; these might be, for instance, two current motion pictures and a hockey game. The viewer is also advised of the cost of each program, which may range from twenty-five cents for movies for children to one dollar for a new adult film. Once the proper amount has been dropped into the box, the chosen picture immediately flashes on the screen.

In every community there is at least one channel not used by regular television stations. From a technical standpoint,

CUNNINGHAM

Home viewers might pay for the programs they want to see by dropping coins in a gadget on the set.

what the box does is to take the picture from the wire and direct it into one of these unused channels on the home receiver. This makes it possible for the viewer to switch between free TV and pay TV.

The second way of distributing pay-as-you-see TV is over the air, very much as free TV is broadcast. This method avoids the extremely high cost of wiring together whole towns or cities. Trying to rewire such a city as New York for pay TV could take many years. To preserve the element of privacy in toll TV over the air it is necessary to use scramblers and unscramblers. At the broadcast station a scrambler mixes up the picture and the sound of a program so that the video and the audio become only meaningless jagged lines and crazy noises. The person willing to pay for a program receives a box containing an unscrambler, which restores both the picture and the sound to their original state.

The Zenith Radio Corporation, a large manufacturer of sets, and RKO General, Inc., a major independent TV broadcasting concern, are planning to test on-the-air toll video in Hartford, Connecticut. By their method, fees can be collected either in a coin machine in advance of the show or by billing after the program is over. Most veteran showmen prefer to be paid in advance: a disappointed audience might be tardy in paying for a flop show.

A serious handicap for on-the-air toll television is its need for a broadcast channel. There are not enough desirable channels for all who might wish to offer television programs. (The Federal Communications Commission, the agency established by Congress to supervise broadcasting, has the task of apportioning channels.) Since a broadcast station can transmit only one program at a time, authorization of a toll service would mean the displacement of some free shows. This has been a cause of bitter contention between the supporters and the opponents of pay-as-you-see television.

A solution to the channel problem may lie in the development of a new set of channels called "ultrahigh-frequency" television. U.H.F. channels, which are numbered 14 through 83, cannot be received on most present sets, which tune in Channels 2 through 13, without extra receiving equipment. The FCC is conducting tests of U.H.F. but, until the results are known, considerable uncertainty faces on-the-air pay television.

What are the arguments for pay-as-you-see TV? The most advertised attraction is the promise of freedom from advertising. With the viewer footing the bill, it is assumed that he would be assured of liberation from the annoyance of intrusive commercial announcements and interminable interruptions.

More basically, pay TV's case touches on fundamental cultural considerations. Its proponents maintain that the form and shape of TV could be improved if satisfaction of the audience were the sole criterion. With free TV, supported by advertising, it is held, the sponsor necessarily must think first of what is best for the sale of his product. Since his normal goal is to achieve maximum sales, he must try to please as many people as he can at the same time. Such a philosophy, the proponents of toll TV argue, invites a sameness and mediocrity in programing because the economics of advertising seldom allow the minority to be catered to. With toll TV, a national audience of one or two million paying viewers could finance the finest type of dramatic attractions. For the first time the public could make its influence felt directly on TV through its power of patronage.

Interest in pay TV, however, also reflects a deep economic problem. Free TV has had serious consequences for many industries. The Hollywood motion-picture industry has been most critically affected; it is still shrinking under the relentless competition of TV. Hollywood—its producers, writers and players—sees in pay TV the remedy for all its ills. Sports producers, through a wired TV system connecting theaters, envision huge grosses in the future. Meanwhile, with free TV, minor-league baseball, for example, has all but perished.

What are the arguments against pay TV? The chief opposition naturally comes from today's broadcasters who do not want anyone tampering with their gold mine. They argue that the airwaves, which legally are the property of all the people, should not be restricted to those who can afford to pay. Once toll TV became accepted, they say, today's free shows would gravitate to the new system with its bigger economic rewards. In time, the public would find itself paying for what it now enjoys free of charge. Moreover, the broadcasters continue, the operator of a toll system would be driven by an urge to make the maximum amount of money, which would mean putting on shows with the widest appeal. Movie producers, they say, never offered symphony concerts or Shakespeare's dramas when they could present Marilyn Monroe or Frank Sinatra.

A further point advanced by the defenders of free TV is that there is more to television than the presentation of entertainment attractions for which a charge can be made. The job of covering the news, political debates and speeches of the President, as well as many other public-service functions, could not be maintained if the revenue-producing shows were siphoned off to a competing form of TV.

The broadcasters also contend that public financing of shows would not necessarily resolve the financial problem. If a pay-TV program could gross $10,000,000 in a single showing, all the participating craftsmen—stars, authors and backstage labor unions—would seek higher percentages of the total.

As with all arguments, the opposing camps in pay TV have an answer for every claim or complaint made by the other side. Bystanders have noted, however, that both forms of video labor under a handicap that will never be entirely conquered: TV can devour so much material so quickly that it is humanly impossible for all its programs to be good.

What is the future of pay TV? For many years the toll system will be grappling with the awesome problem of trying to decide whether the chicken or the egg comes first. If pay TV is to gain an audience, it must offer attractive programs not otherwise available on the home screen. But if it is to be able to afford to offer such programs, it must have a large enough audience to make them feasible. How to get over this hurdle is the foremost challenge confronting the system. At a minimum it will involve the expenditure of millions to learn whether there is a chance of lasting success.

The fate of toll TV is seemingly linked to two unknown factors. First, if the level of free TV remains static, with the bulk of its programing consisting of routine Hollywood output, the demand for more substantial video fare could be formidable. Under the pressure of intensified competition between networks and sponsors, the base of TV has tended to narrow. Thus far, the major support of toll TV has come from students of the medium, from Hollywood interests, which stand to gain financially, and from practicing artists who feel that theater in the home can never flourish under the thumb of the advertiser.

But a substantial mass outcry for a change or an alternative system of TV has not materialized. The time people spend in watching TV has not declined with the passing years if the industry's own statistics are to be accepted. And broadcasters and advertisers are confident that resentment over commercials is not strong enough to persuade viewers to assume an expense that at present does not exist.

The idea of pay-as-you-see television has made newspaper headlines practically since the advent of commercial TV in 1947. But since that time neither tests in Canada nor earlier trials in Palm Springs, California; Bartlesville, Oklahoma; and Chicago, Illinois, were sufficiently extensive to permit of firm conclusions. Toll TV consistently has suffered from the handicap of being more vigorously promoted than demonstrated. Which perhaps explains why pay-as-you-see TV often seems a fascinating enigma peculiar to the electronic age: it is.

ON STAGE!

By LANE MANDRY

IN contrast with the general dullness on stage during 1960, off stage there was unusually lively discussion—of that perennial problem, the theater's ailing health. The actors' strike that darkened Broadway houses for almost two weeks in June pinpointed a major symptom, the economic chaos of production on Broadway, a chaos that has begun to threaten Off Broadway as well. This situation is discussed in "Economics of the Theater," page 377, but it was not the only issue to be aired.

BILL ENGDAHL, HEDRICH BLESSING

Model of the theater to be erected in Washington, D. C., for the Arena Stage. The roof is raised to show the square interior with its central stage.

It seems to some critics that there has been an alarming growth in the proportion of new plays that present a sick view of life. Their characters seem neurotic weaklings at best, trapped in self-defeating attitudes or in vicious habits without hope of escape. Other critics feel, however, that the serious writers of such plays have been holding up a mirror to our time, documenting the loneliness and despair that haunt many men and women. From this view such plays are valid as a reflection of real experience. Certainly among them are some of the most forceful postwar plays such as *Death of a Salesman* of more than ten years ago, by Arthur Miller. It may be significant therefore that in the course of an interview for *Harper's* in 1960 Miller remarked that "blue" plays are "quite suddenly going to become old hat." He added, "The theater as yet has not got the reach, the breadth of vision to see much more than the center of the web in which we struggle. But I think there are indica-

Julie Andrews, as Queen Guenevere, leads a spring frolic number—*The Lusty Month of May*—in the musical *Camelot*, based on the Arthurian legends.

The spirited Tammy Grimes romps with miners as she begins her career as *The Unsinkable Molly Brown.*

James Thurber, flanked by Paul Ford and Peggy Cass, makes a bow in his own *Thurber Carnival.*

tions that we may have a right to state once again that all is not lost. And as soon as that really happens, the black air surrounding many plays may appear unjustified; it will not long seem the way things are; and the style itself will seem willful and self-conscious."

Perhaps "style" is the key word. Although Lillian Hellman's first offering in some years, *Toys in the Attic,* probed ugly relationships within a decaying New Orleans family, it triumphed by reason of Miss Hellman's gift for drawing character, her perception of life's meaning and, not least, her compassion. It was superbly acted by a cast headed by Jason Robards, Jr., Maureen Stapleton and Irene Worth and was voted the best American drama of the 1959–60 season by the New York Drama Critics Circle.

As love of money in part motivates the action of *Toys in the Attic* so does it pervade *The Deadly Game.* This play was adapted by James Yaffe from a novel by the Swiss writer Friedrich Duerrenmatt. Like Duerrenmatt's chilling *The Visit, The Deadly Game* is a study of the malice that lurks in human nature.

In a presidential election year two "political" plays seemed apropos. The setting of *The Best Man* by Gore Vidal is a nominating convention. In the behind-scenes maneuvering between candidates, and helped by an excellent cast headed by Melvyn Douglas, the play made hilarious mockery of the nominating procedure. *Advise and Consent,* taken from the Pulitzer Prize novel by Allen Drury, which opened after Election Day, analyzed the Senate and its relationships with the White House.

The horrors of the uprising in the walled-in Warsaw ghetto toward the end of World War II inspired two plays. *The Wall,* taken from John Hersey's novel of the same name, is a searing indictment of a monstrous crime. Yet perhaps because it was instinct with a will to life it carried enormous if shattering conviction. *Behind the Wall,* an Off Broadway drama by Kenneth Green, was less successful. It aroused the same sympathies but, dependent on child actors, lacked the requisite power.

Several plays by European authors bowed. Jean Giraudoux's *Duel of Angels,* translated and adapted by Christopher Fry and with Vivien Leigh and Mary Ure in the leading roles, was a devastating examination of self-righteousness. From another French playwright, Jean Anouilh, came *Becket,* a rather worldly interpretation of the relation between Henry II of England (Anthony Quinn) and Thomas à

ALL PHOTOS, UNLESS OTHERWISE SPECIFIED, FRIEDMAN-ABELES

Dudley Sutton, Avis Bunnage, Leila Greenwood, Aubrey Morris in Brendan Behan's rowdy *The Hostage*.

Becket (Laurence Olivier) that, as a matter of history, ended in Becket's murder in Canterbury Cathedral. From the pen of the late Albert Camus, Nobel Prize winner, came a "philosophical melodrama," *Caligula*. Camus' theme, "One cannot be free at the expense of others," was illustrated by the life of the most notorious of the Roman emperors.

Depending on taste, Broadway theatergoers were regaled or shocked by *The Hostage*, the uproarious work of an uninhibited Irish writer, Brendan Behan, that had earlier set London agog. *A Taste of Honey* also focused on the seamy side of life yet with warmth and honesty, an astonishing play to come from a nineteen-year-old girl, Shelagh Delaney of Lancashire. The splendid cast included Angela Lansbury and Joan Plowright, the latter a young actress who scored a personal triumph.

A Thurber Carnival provided a welcome leaven. It was a compendium of the fables of James Thurber, one of today's few real humorists. He himself entered the cast in the fall of 1960 with delightful results. Another joy on Broadway was *An Evening with Mike Nichols and Elaine May*. With an air of great good humor these intelligent comedians directed their talent for wicked satire at almost everything in sight, equally irreverent about PTA meetings and TV interviews.

Rock n' roll and teen-agers came in for a share of satire in the musical *Bye Bye Birdie*, with a score by Charles Strouse and Lee Adams and a book by Michael Stewart. Unpretentious, it had a breezy freshness. Big-city underworlds were the take-off point for two other musicals: *Irma la Douce*, a farce set in Paris, which made a star of a beguiling English comedienne, Elizabeth Seal; and *Tenderloin*, set in that once notorious area of New York around the turn of the century. *Tenderloin* boasted the presence of Maurice Evans as a reformer-clergyman. *The Unsinkable Molly Brown*, based on the real-life story of a survivor of the Titanic disaster, bemused audiences as it recounted its heroine's climb up the social ladder from her youth in a rough Colorado silver-mining town. Tammy Grimes was an endearing bundle of energy in the title role. Late in the year came *Camelot*, a venture into the Arthurian myths. It brought together again writer Alan Jay Lerner, composer Frederick Loewe and star Julie Andrews, all of *My Fair Lady*.

The most unusual theatrical event in the United States was the visit of the Japanese Kabuki theater, which has enthralled audiences in its home country for more than 350 years. Kabuki acting is rigidly stylized in the direction of bold exaggeration. Every move, gesture and tone of voice follows tradition in a blend of opera, dance, drama and comedy. Besides being a highly polished art form, Kabuki ravishes the eye with spectacularly beautiful costumes and sets.

Compared with the run of Broadway fare, the Off Broadway theater continued to be more daring. Long runs were enjoyed by *The Balcony*, by Jean Genet, perverse and squalid; *The Connection*, a shocker by Jack Gelber about dope ad diction; and a double bill, *Krapp's Last Tape* (by Samuel Beckett) and *The Zoo Story* (by Edward Albee), sketches of futility enlivened by intelligence and gleams of grim humor. Revivals of classics abounded: Shakespeare's *Henry IV*, Parts 1 and 2; Gilbert and Sullivan's *Pinafore;* Ibsen's *An Enemy of the People* and *Hedda Gabler;* Chekhov's *A Country Scandal;* Oliver Goldsmith's *She Stoops to Conquer;* and two productions of Shaw's *Man and Superman.*

The Arena Stage, in Washington, D. C., whose artistic standing has been steadily rising and which in 1960 enjoyed its most successful season, is at last assured of a permanent home. Various funds and private sources have contributed most of the $425,000 required for a new building and the District government has allocated the necessary land. Designed by Harry Weese, the new theater will retain the idea of a central stage.

The summer Shakespeare festivals in the Stratfords continued to merit their popularity. Visitors to the Connecticut festival saw a delightful performance of *The Tempest* with Morris Carnovsky as Prospero, and Katharine Hepburn in both *Twelfth Night* and *Antony and Cleopatra.* The Ontario company put on the seldom-played *King John,* with Christopher Plummer, and an unusually lively version of *A Midsummer Night's Dream.*

Among the outstanding features of the year on London, England, boards were *Ross,* by Terence Rattigan, in which Alec Guinness played the spectacular and enigmatic Lawrence of Arabia; the extremely advanced *Rhinoceros,* by Eugene Ionesco and with Laurence Olivier, in which human beings gradually become the beasts of the title; and *A Passage to India,* a dramatization by Santha Rama Rau of E. M. Forster's famous novel. The last won praise on every score, not least for the rare skill with which Miss Rama Rau had transferred a revered book to the stage. Broadway was scheduled to see it in February 1961.

Paris critics worry over the dearth of new plays by French writers. One reason given for this is the policy, since 1954, of the Théâtre des Nations of bringing famous foreign companies to Paris from all over the world, a broadening experience that French playwrights seem not to have caught up with yet. The smashing success of Françoise Sagan's first play, *Château en Suède* (*Castle in Sweden*), was all the more a bombshell. Its eccentric characters are forced to wear eighteenth-century costumes, to match the castle's architecture, although the time is the present. As one Paris critic expressed his pleasure, "The author is marvelously gifted. Rainbows of dialogue and tunnels of dramaturgy." The play was expected to run for several years.

The West German theater is described as a "miracle" similar to the recovery of German industry since the war. Performance after performance, its two hundred playhouses are packed. The backbone of this attendance record is the Volksbuhne Verein, a national audience association supported by government grants and subscription fees of some half million members. It gets about a third of the twenty million seats available a year, and members pay about seventy cents each. However, there are complaints of overorganization besides the fact that members have no choice of seats or of what they will see. There is further objection on the score that the art of the theater is being degraded for lack of critical audiences.

Sweden has another novel arrangement, a theater lottery held each month. About 1,500,000 tickets at $3.00 each are sold by a government-owned company. On each ticket there is a profit of $1.24, of which $.24 goes to the arts and $1.00 to social-welfare services. Prizes run from $60 on up to $40,000. In addition there are special yearly lotteries with tickets at $20 apiece. The proceeds help not only the theater but opera and orchestras.

For years the Royal Dramatic Theater (the Dramaten), which has an international reputation, had no rival in Stockholm. That situation was altered by the opening of the new Stadsteatern (City Theater) in the fall of 1960. It is a repertory theater, keeping several plays in preparation at once, ranging from Brecht to Strindberg.

ECONOMICS of the THEATER

By JUDITH CRIST

Editor for the Arts
THE NEW YORK HERALD TRIBUNE

LAST year will go down in stage history as the year of the second revolt of the actors. For the first time in forty-one years, Broadway theaters were blacked out and stayed dark for ten days until Actors Equity wage demands were met.

Twenty-two straight plays and musicals were closed down. About 5,000 theatrical employees—fewer than 1,000 of them actors, the rest stagehands, musicians, house staff, press agents, box-office men—were out of work. Tens of thousands of theatergoers turned back their tickets. Box offices lost almost $1,000,000 and all the fringe beneficiaries—cabbies, restaurateurs, ticket brokers—suffered as well. Ten days later, with a pension plan and various wage benefits won by the actors, Broadway business resumed as usual; only three plays, all doing marginal pre-strike business, failed to reopen.

But the brief blackout added further significance to 1960 theater. It became the year when a few facts and figures began to emerge about the fabulous invalid, whose economic life has long been—and, for the most part, still is—shrouded in mystery. There have been calls for fact-finders, for collaborative analyses of just what is wrong with the theater (aside, that is, from its cultural quality), how to get away from the hit-or-flop life that plays lead, how to permit a marginal play to survive until it finds its own fans, how to keep the box office from outpricing itself in the eyes of an ever diminishing theatergoing public. The astonishing revelation during the ten-day period of soul-searching and fact-seeking was that there are no economic "facts" about the theater, that the best one can do to analyze its ills is to use a "for instance," and that most generalizations are false.

But with all the moans and groans and bits and pieces of statistics hurled in the actors-versus-producers battle, it still became apparent once again that George M. Cohan's old saw still holds good: "There is never anything wrong with the theater that a good show won't cure."

A favorite figure offered by the gloom-and-doom side is that thirty years ago, during the 1927–28 season, 264 plays came on the boards of 75 theaters: during the 1959–60 season, 53 plays opened and only 32 houses were operating. Twenty years ago, producers note grimly, you could put on a musical for $80,000; today it's around $400,000. A straight play could be brought on stage for $10,000; now its costs can run to $150,000. In those days there were tickets for 55 cents, albeit in the second balcony; today those seats are about $2.40 and you pay almost $7.00 for the top ticket to a straight play and $10.00 for a musical. Kermit Bloomgarden notes that

Broadway theaters were dark in June when the Equity strike temporarily closed twenty-two shows.

NEW YORK TIMES

in 1935 he produced *The Children's Hour* for $6,000 and made a profit when $5,000 a week came into the box office. His 1952 revival of the Lillian Hellman play cost $50,000 and just broke even on $16,000 a week.

Sixty-two shows headed for Broadway in the 1959–60 season. Nine folded during their out-of-town tryouts. Of the 53 that came in, the League of New York Theaters (the association of producers and theater operators) reported that only 13 were in the hit category. Of the estimated $8,525,000 invested in all the shows, the 40 flops cost their investors about $5,200,500. (Some of this, of course, will be recouped by movie sales and revivals.)

But had it been such a terrible season? One out of four shows made money or was slated to. The Broadway odds of three to one against having a hit held good—just as they had thirty years ago despite the large number of entries. During the season (which runs through May 31), box offices took in a total of $45,665,500, an increase of $5,500,000 over the previous season. But there were an estimated 500,000 fewer theatergoers; it was the soaring cost of theater tickets that bulged the box office.

Rising ticket prices—soaring production costs—a diminishing audience—these are but a few of the invalid's ailments. And yet it lingers on, simply because there are playwrights, directors, actors, producers—and, above all, investors—who administer the necessary transfusions.

What are the economics and routines of producing a play? Each play is a special case, but the procedure is roughly this. First comes the encounter of producer and playwright, or script. The play decided upon, the producer signs a contract with the playwright. Beyond the producer's agreement to produce the play in a year or surrender his rights to it, and protection of the author's rights in casting and so on, the standard Dramatists Guild contract provides for the playwright to get 5 per cent of the first $5,000 weekly gross, 7.5 per cent of the next $2,000 and 10 per cent of everything over that. Then a director is chosen, with agreement usually involving a flat fee plus a percentage of the gross. (The newly formed Directors Guild hopes to standardize the remuneration.) A designer, for sets and costumes, must also be found, usually on similar terms.

Casting then begins—and here another of the invalid's ailments is apparent: starophilia. A going theory is that you

With signs identifying their shows, Actors Equity members crowded into the Astor Hotel on May 24 to plan their fight for higher wages and pensions.

WIDE WORLD

must have stars, big names to pull in the customers. (But please note: *The Tumbler*, starring Charleton Heston in his big *Ben Hur* year and directed by Laurence Olivier, lasted five performances and lost $113,000; Tony Perkins could not save *Greenwillow;* nor did Henry Fonda save *Silent Night, Lonely Night* its loss of $85,000.)

Certain it is, though, that some big names make shows: Ethel Merman, Mary Martin, Jackie Gleason—these mean money in the bank in advance, both through individual mail-order advance ticket sales and through theater-party bookings. But big stars come high and nowadays won't work for simple salary but for a share of the gross and, on occasion, of the profits. Merman, Martin and Gleason reportedly take over $8,000 a week respectively out of *Gypsy*, *The Sound of Music* and *Take Me Along*. In *The Best Man*, for example, Melvyn Douglas, Lee Tracy and Frank Lovejoy get 10, 5 and 5 per cent of the gross respectively. A *Fortune* report on this current hit noted that 34 per cent of the money that came into the box office was committed before the show even went into rehearsal: 20 per cent to the three stars; 10 per cent to playwright Gore Vidal; and about 2.5 per cent to the director and .5 per cent to the designer (each of whom also received a flat fee) and one per cent to the producer.

Actors of the nonstar variety usually get a straight salary, from anything down to the minimum. Before the revolt in June, minimums on Broadway were $103.50 a week for actors. Actors were, in fact, in the lowest minimum category. Grips (moving men), prop cleaners, floodlight operators, flymen and curtain men got $104 at minimum, assistant treasurers $110, wardrobe supervisors $112.08. Treasurers had a minimum of $130, musicians $155.50, head carpenters, prop men and electricians $156, house managers $176.96 and press agents $247.19. There are eight unions besides Equity that establish and enforce these minimums. The Broadway theater is completely unionized and operates as a closed shop. The actors' new minimum for Broadway is $117.50. Thirty-one of the forty-eight performers in *Fiorello!* were on minimums at the time of the strike: the total weekly actors' payroll for this no-big-star musical is about $9,000.

The producer's big hunt, however, is for a theater. With a two-to-one overflow of plays in even so "bad" a season as the last one, houses are at a premium. Some of the lesser producers have complained that they are cold-shouldered by theater operators in favor of surer-fire shows, but it is understandable that the operators' primary interest is in keeping their houses lighted. The usual theater rental on Broadway is 30 per cent of the gross. This is, on the face of it, high—but theater operators point to high rents or mortgages and operating costs. (Theaters do occupy high-priced real estate and antiquated building laws long prevented full usage of the buildings.)

The average theater employs the box-office treasurers, house manager, carpenter, electrician, flyman, property man, matron—at least one of each—ushers, porters, watchmen and stagehands, plus some of the musicians. Between rent or mortgage interest and payroll, the average theater's costs are about $7,000 a week. Its tenant must gross over $23,000 for a break-even point. Many rental contracts provide that when, for two or more weeks, the gross drops below that point the show must move out. This is particularly true at the height of the season and is why a play that still has an audience, or a hit in the last days of its run, is forced to close for lack of a home.

While getting the show into production, the producer also has to do some fund raising. Established producers have lists of tried and true backers—"angels" —many of whom have been with the producers through flop and hit, on whom they call regularly. Theatrical investment companies have been springing up in recent years, but the novice is warned against the quick-profit boys. Before selling "pieces" of his play, a producer must register the offering with the Securities and Exchange Commission. He must deposit all investment for his new show in escrow, not touching any of it until it is all secured. He must account for every penny spent, although there is always that flexible "miscellaneous" entry in accounting. Once the investment has been repaid, investors and producers share the profits, fifty-fifty.

With his backing secured, the producer finally gets his show on the road. Good reports from the tryout cities (Wilmington, Boston, Washington, Philadelphia, New Haven) make for the sudden rush. either by investors or theatergoers beseiging the box office in advance. *The Sound of Music* set a record with a $1,500,000 advance sale—but who wouldn't risk his ticket money in advance on Rodgers and Hammerstein and Mary Martin? *Saratoga*, with Howard Keel and Carol Lawrence, had been booked by 116 theater parties before press and public alike gave it a less than lukewarm reception. But *Fiorello!*, for example, was a sleeper with no name stars, that came in with virtually no advance sale but went on to smash success and the Pulitzer Prize for 1960.

Advance sales and theater-party bookings can keep a mediocre show going beyond its critic-ordained time; but there are shows that are "critical" successes and box-office failures. *The Andersonville Trial* won high praise from reviewers and it ran for twenty-three weeks. But its investors got back only $30,000 of their $90,000 investment, although they may get more from a possible movie sale as well as from the album recorded by the cast and possible revival of the play on the road. Sixty per cent of the revenue from motion-picture sales goes to the playwright; 40 per cent goes to the producer-investors. Who made money from *The Andersonville Trial?* During the four months of its life, the thirty-one cast members drew $147,000 in pay; the theater got $121,500 as its share; the playwright got $37,000, the director $20,600 and the three producers, who drew $300 a week to operate their office, got an additional $6,000.

What about a critical and box-office success? Playing to packed houses throughout the season, *The Sound of Music* was only beginning, in the early autumn of 1960, to show a profit because of the heavy production and operating cost. *Fortune* estimates that eventually *The Best Man* will take in about $3,000,000 in its Broadway box office; this would net the author and top star about $300,000 apiece and return to the backers not only their original $105,000 but $200,000 more. And so, when it comes to investing, the angel will remember *The Best Man* and *My Fair Lady* (which was backed entirely by the Columbia Broadcasting System) and forget *Saratoga* and *The Tumbler*. Rising costs have made the investor's losses greater and his returns smaller; thirty years ago the payoff on hits averaged ten times its present $3 for $1. Producing is a limited business. The League of New York Theaters has 126 members, but only 17 were active, responsible for 22 shows, at the time of the stoppage, and only a handful make theater their full-time business. Of Equity's 9,600 members, only about 750 were working on Broadway at the time.

But how does the profession's business side affect the theatergoer? Ticket prices are high, although they have not gone too far apace from the cost of living. And the theatergoer is faced with endless waits for hit tickets or with a fling at a flop. That four times as many shows were available thirty years ago is understandable. Theater was then a major entertainment, for talking pictures, let alone television, had not yet taken their toll of its audience.

The debate, of course, is endless on the merits of Government sponsorship, a national theater or other subsidies. The sellouts in New York City's subsidized City Center, the crowds at its free Central Park Shakespeare Festival and the success of low-priced road companies and summer stock across the country indicate that the audience is there. As for the business side of show business, Mr. Cohan's dictum holds. Or, as Roger L. Stevens, producer of *The Best Man* and of seventy-three other shows, told *Fortune's* reporter, "When you have a hit, it seems very easy."

FOREIGN MOTION PICTURES IN THE UNITED STATES

Americans have been viewing and enjoying foreign-made motion pictures since the early days of the silent screen. For many years, art theaters across the country have been showing high-quality imports. Recently interest in such films has increased considerably. Improved output by foreign film companies as well as the use of new techniques for dubbing (adding of sound tracks in different languages) have given foreign-made films broader appeal than they had in the past. At the same time, since Hollywood is making fewer pictures today, regular motion-picture theaters are using films from abroad to fill the gaps.

FOREIGN-LANGUAGE FILMS SHOWN IN THE UNITED STATES

Including films shown with English subtitles or English-language dubbing

	1956[1]	1957	1958	1959
Number of feature films	323	779	585	708
Estimated gross income from film rental in the United States	$8,385,592	$9,572,968	$14,824,975	$21,500,000

[1] Does not include Japanese-language films in 1956.

SOURCE: *Variety*

FOREIGN FILMS SHOWN IN THE UNITED STATES, BY COUNTRY OF ORIGIN

In the United States, motion pictures from the United Kingdom have proved to be second in popularity only to those produced in Hollywood. Not only is there no language barrier but British customs and ways of life are familiar to most Americans. Many films made in England and starring British actors are not even regarded as "foreign" by the American public. Extreme popularity of a foreign star in the United States often significantly increases American attendance at showings of films made in that star's home country. Because Brigitte Bardot was so tremendously popular in 1958, French films in general made more money in the United States that year. In 1959, however, Italian films moved ahead of French production in earning power because of Italian pictures starring Steve Reeves, an American actor widely admired by teen-agers in the United States.

	1958		1959	
COUNTRY OF ORIGIN	NUMBER OF FEATURE FILMS	ESTIMATED GROSS INCOME FROM FILM RENTAL	NUMBER OF FEATURE FILMS	ESTIMATED GROSS INCOME FROM FILM RENTAL
United Kingdom	76	$27,167,250	116	$18,641,190
Italy	18	1,508,450	96	9,720,060
France	46	8,345,825	78	5,187,508
Mexico	116	3,301,000	106	3,200,970
Japan	296	993,000	218	1,160,480
West Germany	52	509,200	81	662,160
Sweden	3	97,000	9	477,168
India	3	18,500	2	200,000
Soviet Union	12	30,000	59	175,000
Greece	2	31,000	53	107,050
Norway	0		1	50,000
Denmark	7	48,000	1	32,000
Israel	0		1	9,900
TOTAL	661	11,992,225	821	39,626,486

SOURCE: *Variety*

PRIZES AND AWARDS: SHOW BUSINESS

MOTION PICTURES

Academy of Motion Picture Arts and Sciences Awards (Oscars)	
Film	*Ben-Hur*
Actor	Charlton Heston in *Ben-Hur*
Actress	Simone Signoret in *Room at the Top*
Supporting actor	Hugh Griffith in *Ben-Hur*
Supporting actress	Shelley Winters in *The Diary of Anne Frank*
Direction	William Wyler for *Ben-Hur*
Foreign-language film	*Black Orpheus*, France
Feature-length documentary	*Serengeti Shall Not Die*, Germany
Song	"High Hopes" by James van Heusen and Sammy Cahn, *A Hole in the Head*
Screenplay	*Room at the Top* by Neil Patterson
Film editing	Ralph E. Winters and John D. Dunning for *Ben-Hur*
Costume design (black and white)	Orry-Kelly for *Some Like It Hot*
Costume design (color)	Elizabeth Haffenden for *Ben-Hur*
Cartoon short	Edward Harrison and John Hubley for *Moonbird*
Cannes International Film Festival Awards	
Golden Palm Leaves for best picture	*La Dolce Vita*, Italy
Best actress	Jeanne Moreau in *Moderato Cantabile*, France; and Melina Mercouri in *Never on Sunday*, Greece
Jury's special prize	*The Ballad of a Soldier* and *Woman and a Little Dog*, Soviet Union
Other special prizes	*The Adventure*, Italy; and *Kagi*, Japan
Special mention	*The Virgin Spring*, Sweden; and *The Young Girl*, Mexico
Robert J. Flaherty Award for documentary films	*Hoffa and the Teamsters*, the Columbia Broadcasting System
Vancouver Festival Awards	*Ashes and Diamonds*, Poland; and *Marco of the Sea*, Italy

TELEVISION AND RADIO

George Foster Peabody Awards	
Nonmusical entertainment	The Play of the Week, WNTA-TV, Newark, New Jersey; and *The Moon and Sixpence*, National Broadcasting Company (NBC)
Musical entertainment	Great Music from Chicago, WGN-TV, Chicago, Illinois; and The Bell Telephone Hour, NBC
News program	Khrushchev Abroad, the American Broadcasting Company (ABC)
Contribution to international understanding	Small World, the Columbia Broadcasting System (CBS); and The Ed Sullivan Show, CBS
Education	*Decisions*, WGBH-TV, Boston, Massachusetts; and *The Population Explosion*, CBS
Local public service	WDSU-TV, New Orleans, Louisiana
Special award	*The Lost Class of '59*, CBS
Radio news	The World Tonight, CBS
Radio public service	*Family Living, '59*, NBC
Radio local public service	WCCO, Minneapolis, Minnesota
George Polk Memorial Award	Av Westin, writer and producer, and Howard K. Smith, writer and narrator, for *The Population Explosion*
National Academy of Television Arts and Sciences Awards (Emmy awards)	
Dramatic program	Playhouse 90, CBS
Variety program	*The Fabulous Fifties*, CBS
Musical program	Leonard Bernstein and the New York Philharmonic, CBS
Public-affairs program	Twentieth Century, CBS

News program	Huntley-Brinkley Report, NBC
Dramatic actor	Sir Laurence Olivier in *The Moon and Sixpence*
Dramatic actress	Ingrid Bergman in *The Turn of the Screw*, NBC
Comedy performance	Art Carney in *V.I.P.*, NBC
Musical performance	Harry Belafonte in *Tonight with Belafonte*, CBS
Actor in series	Robert Stack in The Untouchables, ABC series
Actress in series	Jane Wyatt in Father Knows Best, CBS
Direction of a drama	Robert Mulligan for *The Moon and Sixpence*
Direction of a comedy	Ralph Levy and Bud Yorkin for the Jack Benny specials, CBS
Dramatic writing	Rod Serling for Twilight Zone, CBS
Documentary writing	Howard K. Smith and Av Westin for *The Population Explosion*
Comedy writing	Sam Perrin, George Balzer, Al Gordon and Hal Goldman for The Jack Benny Show, CBS
Art and scenic design	Ralph Berger and Frank Smith for *The Untouchables*, CBS special
Cinematography	Charles Straumer for *The Untouchables*, CBS special
Film editing	Ben H. Ray and Robert L. Swanson for The Untouchables, ABC series
Electronic camera work	The Winter Olympics, CBS
Children's program	Huckleberry Hound, syndicated
Trustees' special award	Dr. Frank Stanton, president of CBS, Inc.

THEATER

Antoinette Perry Awards of the American Theater Wing (*Tony awards*)	
Drama	*The Miracle Worker* by William Gibson
Musical	*Fiorello!* by George Abbott and Jerome Weidman with lyrics by Sheldon Harnick, music by Jerry Bock; and *The Sound of Music* by Howard Lindsay and Russel Crouse with lyrics by Oscar Hammerstein 2d, music by Richard Rodgers
Dramatic actor	Melvyn Douglas in *The Best Man*
Dramatic actress	Anne Bancroft in *The Miracle Worker*
Musical actor	Jackie Gleason in *Take Me Along*
Musical actress	Mary Martin in *The Sound of Music*
Supporting dramatic actor	Roddy McDowall in *The Fighting Cock*
Supporting dramatic actress	Anne Revere in *Toys in the Attic*
Supporting musical actor	Tom Bosley in *Fiorello!*
Supporting musical actress	Patricia Neway in *The Sound of Music*
Director	Arthur Penn for *The Miracle Worker*
Musical director	George Abbott for *Fiorello!*
Costume design	Cecil Beaton for *Saratoga*
Scenic design of a musical	Oliver Smith for *The Sound of Music*
Scenic design of a drama	Howard Bay for *Toys in the Attic*
Special award	Burgess Meredith, director of *A Thurber Carnival*
Special award	James Thurber, author of *A Thurber Carnival*
Choreography	Michael Kidd for *Destry Rides Again*
Clarence Derwent Awards for best supporting roles ($500 each)	William Daniels in *The Zoo Story* and Rochelle Oliver in *Toys in the Attic*
Drama Critics Circle of New York Awards	
Best play	*Toys in the Attic* by Lillian Hellman
Best foreign play	*Five Finger Exercise* by Peter Shaffer
Best musical	*Fiorello!*
Off-Broadway Awards (*Obies*)	
Best all-round production	*The Connection* by Jack Gelber
Actor	Warren Finnerty in *The Connection*
Actress	Eileen Brennan in *Little Mary Sunshine*
Director	Gene Frankel for *Machinal*
Pulitzer Prize for drama ($500)	*Fiorello!*

RECREATION and SPORT

CREATIVE PASTIMES

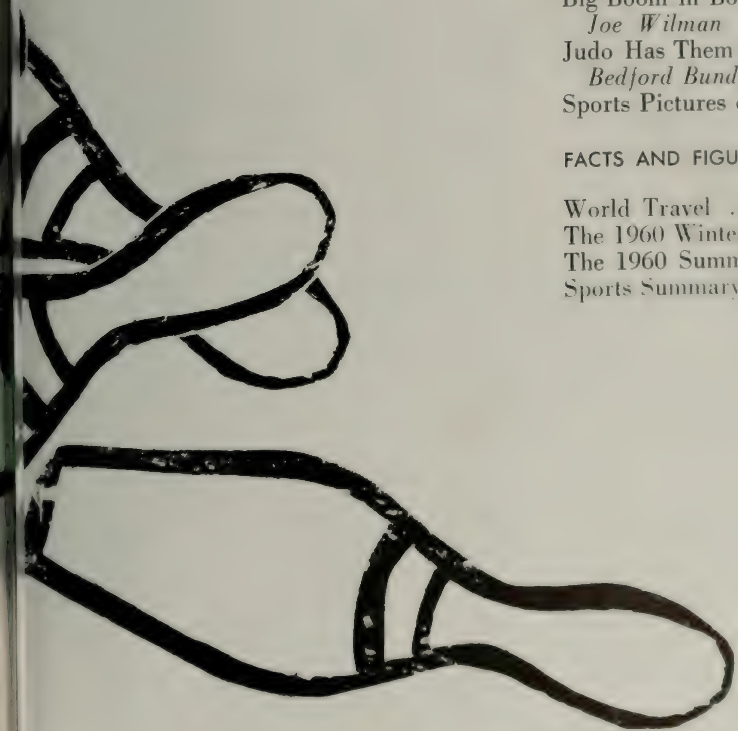
Ship-Model Building
Robert H. Burgess 386
Wild-Flower Gardening
Martha Compton 388
Fishing Tackle—New Trends
Joe Brooks 391
Shell Collecting
Mary Mott 394

SPORT PARADE

Gridiron Pros
Hugh Brown 396
Big Boom in Bowling
Joe Wilman 399
Judo Has Them Flipping
Bedford Bundy 402
Sports Pictures of 1960 404

FACTS AND FIGURES

World Travel 410
The 1960 Winter Olympic Games . 412
The 1960 Summer Olympic Games 413
Sports Summary of 1960 416



SHIP-MODEL BUILDING

By ROBERT H. BURGESS

Curator of Exhibits

THE MARINERS MUSEUM

THE making of ship models is one of the most rewarding and relaxing of hobbies for both young and old. It develops patience and skill and provides a way of using spare time profitably and creatively. Also, as his work progresses, the modeler finds himself becoming increasingly interested in both ships and history.

How successful a ship model is depends only upon the skill and craftsmanship of the maker. One person may create a work of art that is a faithful and detailed replica of an actual ship. Another may produce a model that is unlike anything that ever sailed the seas. In both cases, however, the modelers have enjoyed many hours of satisfying labor, and that is sufficient reward.

The beginner can determine how much skill he can develop only by actually undertaking to construct a model. The novice should start with something relatively simple, perhaps a kit model, and should not expect to produce a masterpiece in his first attempt. The "feel" for working with small tools and the art of working in a small area, as on the model's rigging, must be developed and can come only with experience.

Within recent years many short cuts have been introduced in ship-modeling. Plastic cast hulls and fittings and preshaped wooden hulls make it possible for almost anyone to produce a model pleasing to the eye. But many modelers prefer to start with a plain block or plank of wood.

The beginner with little knowledge of ships and tools will have fun in assembling the pieces provided in a plastic ship-model kit. Many different subjects are available in these kits—yachts, naval craft and steam and sailing vessels. Not too much skill is required for this kind of model-making since most of the pieces merely have to be glued together. Because of the fine detail of many of the pieces, however, close adherence to instructions can produce a very satisfactory model. Working with kit material, the modeler becomes familiar with the various parts and fittings of a ship. Then, when he has acquired sufficient knowledge, he usually wants to move on to more difficult models requiring the use of tools.

The normal procedure would be for him to advance to another kit model with a hull of wood, and only rough-shaped. All fittings and rigging are supplied and building the model is merely a matter of following the simple plans that are furnished with the kit. Properly assembled, rigged and neatly painted, such a model can be most attractive for display and will encourage the maker to go on to more difficult tasks. It will also be greatly admired by his friends.

The model in which the builder takes greatest pride is that which he has constructed from raw materials, guided only by plans of an actual ship. He shapes the hull by hand tools, using as guides templates (patterns) that he has himself made. The fittings are made with the aid of a lathe or by casting in metal. When one graduates to this level, a working knowledge of tools and a good assortment of them, as well as a workshop, are essential.

Kit models can be obtained from most hobby, sports or department stores. Mail-order houses also stock them. In the larger cities some stores carry a greater variety of kits, plans, tools and supplies of fittings. Simple plastic kits are priced from 89 cents to as much as $18. The higher the price, the more detailed and satisfactory the end product.

Anyone seriously interested in making ship models soon departs from the plastic version and undertakes one with a wooden hull. Ready-shaped wooden-hull kits and component parts run as high as $42.50 or even slightly higher. The finished model, with hull of white pine or mahogany, may measure as much as three feet in length. A simpler model, not quite so finished or detailed, and with balsa hull, might cost from about $1.50 to $9.00. In this latter type, the general contour of the ship's hull is already complete. It is just a matter of some final shaping of bow and stern and of sanding to a smooth finish.

For one just venturing into model-making, it is best to visit a museum where ship models are displayed. It is also a good idea to read up on the subject to learn about proper materials to use, if other than kit models are to be worked upon. Good hints on tools and their use, as well as tips on making fittings and rigging, may also be found in books. Most public libraries carry the popular model-making books. In the large cities there are ship-model clubs where members gather to discuss their models and the problems they have encountered. The national ship-model-building society, Nautical Research Guild, publishes the Nautical Research Journal, 5001 Fourteenth Avenue, Brooklyn 19, New York.

In simple model-making very few tools are required. Tweezers of several different sizes, such as a dentist might use, are necessary, as is a pin vise with an assortment of small drills. Small bank pins called "lils," invaluable as fastenings, can be obtained in stationery stores.

If one has mechanical skill and decides to build a model from plans, shaping the hull from wood and using templates as guides, then a workshop and a more complete tool chest is recommended. At this stage the modeler can manufacture most of his fittings, using a small lathe. A drill press, sander, band saw, jig saw and rip-saw are important. Other useful tools are planes, chisels, hammer, scroll saw, a variety of pliers, X-acto blades, files and small clamps. When a modeler has all this equipment, he is almost a professional. It is not necessary, however, to have such a complete assortment of tools to enjoy the hobby or to produce a first-class ship model.

Models should be built to a definite scale, such as one-eighth of an inch to the foot, or slightly larger. For home display the model should be kept as small as is practical. When completed it should be placed in a glass case for protection from dust and damage. Then the model will stand as a tangible reminder of the painstaking care and the many hours of satisfying labor that went into its construction.

This model of the British ship Britannia shows the detailed care with which such models must be made.

CRABTREE COLLECTION THE MARINERS MUSEUM

WILD-FLOWER GARDENING

By MARTHA COMPTON, *Writer and Lecturer*

IT is possible to grow wild flowers in your own garden, whether you live in town or in the country. You can plant them in a small, shaded spot planned entirely for that purpose or right in your regular flower garden where they will reward you with a fine display of color. Many of the wild-flower plants will disappear after blooming, leaving space for the midsummer annuals.

While we are apt to think of wildings as growing in cool, shady, moist woodlands, many of them will actually grow in full sun or in partial shade. But the most important thing is to study and know your plants and then to choose only the ones that you have found growing under conditions similar to those in your own garden. Your wild-flower garden, to be successful, should be filled as nearly as possible with plants already growing in your own locality. Later on, you may want to have a "collector's corner," with some of the more unusual plants, which you will watch with delight as they adapt themselves to your garden.

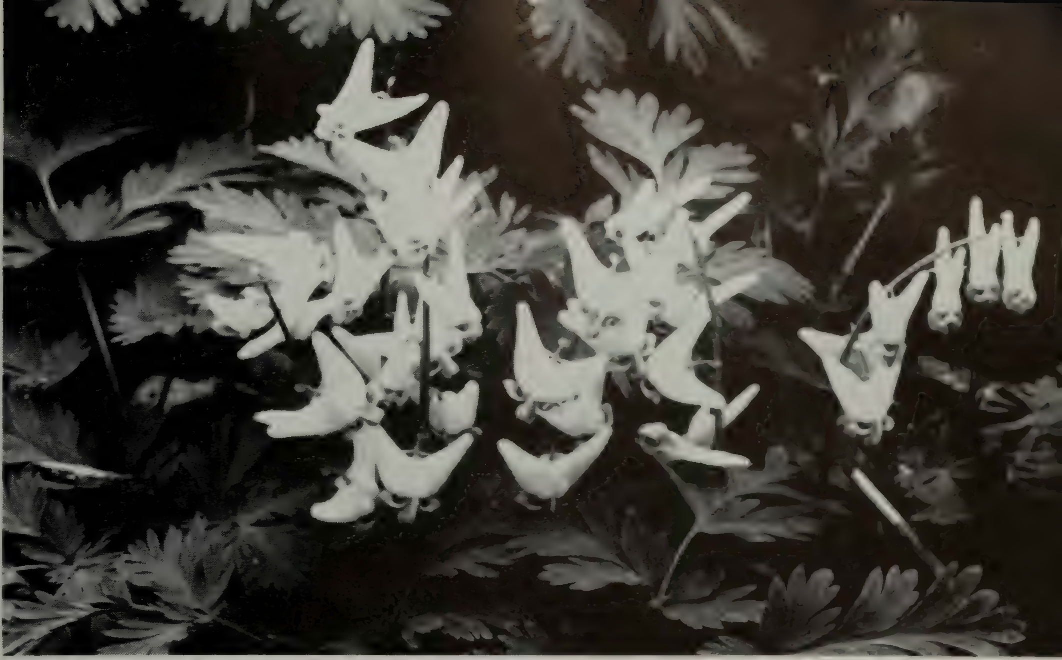
From your wilding garden you will not only derive pleasure but you will have the satisfaction of being your own conservationist. Many American wild flowers are being destroyed by great agricultural developments, by the cutting of forests, by the grazing of livestock in the woodlands and, in the last decade, by bulldozers preparing the land for enormous housing projects. Also, the few remaining country roads are frequently sprayed to eliminate weeds along the roadside. As a result, there has been a wholesale destruction of masses of chicory, Queen Anne's lace, the charming butter-and-eggs, the aromatic bergamot and the meadow lily. The railroads now often burn off their rights of way and, what with spraying, mowing and burning, the natural American heritage of wild flowers is being destroyed.

There are two ways to obtain your wild flowers—by digging them up from the woods and meadows in your locality or by buying plants from a wild-flower nursery in your area. Taking plants from the woods is fine if you are a careful gardener; many of the wildings are not easily moved. In taking up a plant, be careful to take only a part of it, leaving enough to enable it to put out new growth. Always work on a cloudy day if possible, even on a rainy day. If you must work in the sun, keep your newly moved plant covered during the daytime for two or three days, removing the cover at night, until the plant is established. Nursery plants, however, usually have better roots and, if you are fortunate enough to have a good nursery near you, you will be able to get the plants in with little loss of time and be way ahead.

Begin with the early spring plants. One of the loveliest is hepatica, sometimes blooming under the snow and easy to move. This plant, with its pastel-colored flowers that come before the leaves, is often used as a border for the perennial garden. The leaf stems are fuzzy and the leaf remains in good shape throughout the summer. No two plants of hepatica are alike, which gives them true individuality.

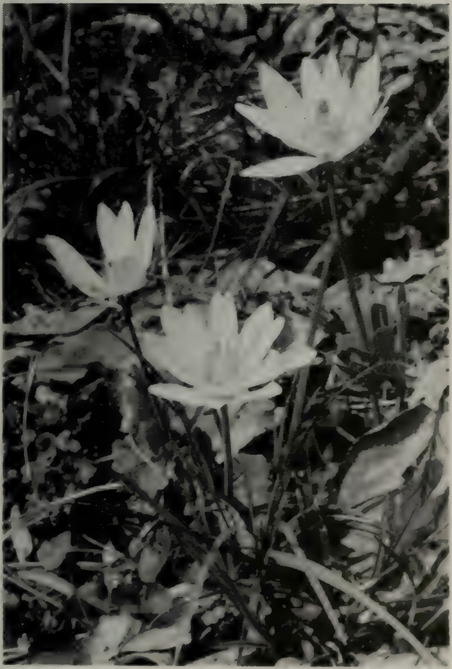
Next is the bloodroot—the most elusive of all the early blooms; it is here today and gone tomorrow. The white, daisy-shaped flower pushes upward wrapped in the leaf, which is gray-green, round and handsome, remaining for some time after the bloom has faded.

For a good color contrast, plant the tiny spring beauty; it will make a pink carpet in your garden. This is the most delicate of all blooms. Coming at the same time is Jacob's-ladder, with its fern-like leaf and bell-shaped flower the color of the sky on a May day. The children call it "bluebell." It has no soil prefer-



PHOTOS J. HORACE MC FARLAND

The "winged" Dutchman's-breeches must be conserved if they are to remain in native woodlands.



The white bloom of the bloodroot, one of the most attractive early wildings, lasts a very short time.

ences and will grow in full sun or shade: it also seems to be one of the few plants that resist mowing and spraying. While the flower is not showy, it is one of the most attractive of the spring wild flowers.

Taking up only small space is that reminder of childhood, jack-in-the-pulpit. Appearing a little late in the woods, its pale green single stalk transplants easily to the cultivated garden. This most interesting plant has stunning red berries in the fall and will spread in your garden.

The lovely woods columbine is fast disappearing and the plant has been so "improved" by the nurseries as to have little resemblance to the woods variety. If you are fortunate enough to have the woods plant, with its cup of red and gold, cherish it.

Mertensia, or Virginia bluebell, is perhaps the queen of the wildings. It is an easy grower, easy to move and requires no special soil. It spreads and then conveniently disappears in a short time. Mertensia's blue flowers quickly turn pink, blending perfectly with the flowers from the spring bulbs, and it is one of the most charming of the wildings.

One of the more difficult plants to move is the Dutchman's-breeches, which is often confused with squirrel corn. Both have blue-gray leaves, deeply cut and fernlike. The squirrel corn is erect and fragrant, whereas the Dutchman's-breeches has a curving stem. Both of these plants are fast disappearing and are on the list of plants especially to be conserved.

Solomon's-seal and the false Solomon's-seal are good for use as background plants. They are both of the lily-of-the-valley family and are very easily confused. The false one is an upright plant, while the true Solomon's-seal has greenish-white bell-like blooms that hang down from a curving stem. Both of these are good house plants, decorative and long-lasting.

The anemone—tall and rue—is part of the wild-flower picture, with its white flowers and delicately cut leaves. It does very well, either in a true wild-flower garden or in the usual flower garden. The wood anemone, or windflower, which was formerly seen in woodlands all over the country, is now rare.

Celandine, a pale yellow spring flower, is particularly beautiful when planted near the blue Jacob's-ladder—a perfect combination. The celandine leaf is almost blue and deeply cut. Since it is a heavy spreader, it may best be left out of a very small garden. This is true also of chicory, that rare blue flower that lined the country roads until lately, when it succumbed to the constant mowing.

Shooting star (known also as American cowslip) is the aristocrat of the wildings. It springs from a rosette of flat green leaves; the dainty starlike leaves, pink-white or lavender, spring from a single stalk; shooting star is not difficult to grow. For many years these plants were commonly seen in the wild state along railroad embankments, in full sun. Now they are almost extinct.

"Great white trillium" is most expressive for the plant that bears its name, as that is just what it is. This huge, white, waxy three-petaled flower is worth the expenditure of any amount of time and effort. Once established, it will spread, and there is no more beautiful flower. It is, however, not easy to transplant and should be purchased from a wild-flower nursery. The wake-robin—another trillium, has three deep red petals. Two unusual trilliums are the nodding and the painted varieties.

Many gardeners like to use wild plants for ground cover. Ginger is one of the easiest; its fairly large, heart-shaped leaf keeps low to the ground and you can see, if you look for it, its tiny low-growing, deep red flower. This ground cover grows fast enough to keep out any weeds. Wild blue phlox makes a good ground cover as do *Shortia galacifolia* and galax, an evergreen herb.

If you have wet spots on your land, try skunk cabbage; though much maligned, it is a stunning plant and an unusual flower. Another plant that likes wet feet is the marsh marigold; when the peepers begin to call in the very early spring, look for this now rare plant, with its thick dark-green leaves and sunlike blossoms.

The lovely Queen Anne's lace, the meadow rue and the purple-stemmed Angelica are best left in the woods, along with the violets. These rank growers, if left to themselves, would eventually mean hours of backbreaking work to dig them out if you wanted to confine them to a given place in your garden.

In a newly planted wild-flower garden there are a few chores that must be performed in the first year. To keep down the weeds is very important and also to keep your garden moist—not wet, just moist. Mulch is very important, to protect the plants from cold during the winter. The use of oak leaves in moderation is good, or peat moss. In the spring, do not remove the mulch, as it will eventually go back into the soil, enriching it. Do not let your mulch get heavy or packed down and do not put it too close to the crown of any plant. The second year there should not be any weeds or any upkeep except to renew the mulch. Autumn is the best time to start the wild-flower garden, but with care some plants can be moved at almost any time.

In this world it sometimes seems easier to destroy than to preserve. For the real gardener there is great satisfaction in making wild flowers part of his garden, thus helping to preserve our heritage.

Fishing Tackle -- New Trends

JASSID FLY

By JOE BROOKS

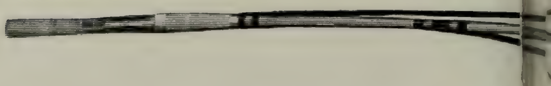
Free-Lance Writer and Publicist

MAN'S inventive genius has long sought new ways to best the elusive fish. Over the centuries the improvement in fishing tackle has been consistent if slow, but of late years the new tackle reaching the market has hit an all-time high in efficiency. In the United States, at least, this is due to a tremendous consumer demand created by some 35,000,000 anglers, of whom considerably more than half fish the sweet-water lakes and rivers. As a result of this huge market, American tackle manufacturers have been able to scoop the world on tackle improvements. They have come up with rods of startling new diameters, with entirely new concepts in reels, with smaller diameter monofilament spinning lines, with fly lines coated with glass or plastic (or hollow-cored) that float all day, with lures and flies that are so realistic that the angler himself can scarcely tell them from the natural bait they imitate.

In the past ten years the greatest single change in rods has been the glass stick; today the vast majority of rods sold are of glass construction. The most sensational development in glass came only during the past year with the production of the magnum rod. These rods are so tapered that they may be used with lines of almost any strength, from four-pound test to thirty, and still do a workmanlike job. The taper automatically adjusts itself to the pull of the line. If the pull is heavy, then the tip bends and the brunt of the stress is taken farther down by that part of the rod where the taper fits the pull. With a lighter line, where less pull is exerted, the rod takes the stress much nearer the tip. Fly, spin and plug casting rods are also built on this principle but its effectiveness can most easily be demonstrated with a fly rod. If the angler uses a light HEH fly line, for instance, the magnum rod will bend and carry the weight of the line at the very spot that will assure a good cast. With a heavier GAF line, the rod will take the extra weight much farther down the rod, adjusting itself to the weight of the fly line. And similarly, in the equivalent plug and spinning rods, the rod adjusts to the weight of the lure being cast, to assure the best throw. These magnum rods, while not a panacea for all ills (for nothing takes the place of ideal equipment for each specific type of fishing), are nevertheless by far the nearest approach to the all-purpose rod so long sought by traveling anglers.

The time-honored bamboo rod is now often impregnated with various forms of resin to assure durability and resistance to heat, water and stress. These bamboo rods, while much more expensive than the others, are still preferred to glass by many because of the smoothness of taper that makes for pinpoint casting.

With the sudden advent of spinning in the United States about fifteen years ago, the market was flooded with European reels; spinning had been practiced in many European countries for years. These reels were usually quite large but recently, following the trend to lighter tackle, many smaller reels have appeared. With the sudden popularity of spinning, American manufacturers quickly entered the field. Their most notable contribution was the development of what is known as the "American-enclosed-type" spinning reel. This is a push-button reel that is a boon to beginners, youngsters and old



Magnum rods take different positions with the pull of different weights. As lure weights increase, the heavier strain is picked up by the stronger sections.

sters because it is practically foolproof. It has a tremendous influence in attracting more anglers to this field of sport. The reel is so easy to manipulate and to cast, and so free of backlash and overspin, that even a child can learn to cast in a few minutes.

The same principle has been applied in a new plug-casting reel with built-in adjustable drag and, best of all, with free spool. This allows the plug caster, formerly limited to a relatively heavy lure, to make long throws while using a light lure, even down to one weighing only one eighth of an ounce. When the retrieve is begun the reel engages and brings the lure back at a good speed; and when the fish hits, the reel handle turns (which is not the case with the spinning reel), thus giving the angler a more "hand-to-hand" feeling in his fight with the fish. This plug-casting reel also features the push-button control used in the American type spinning reels.

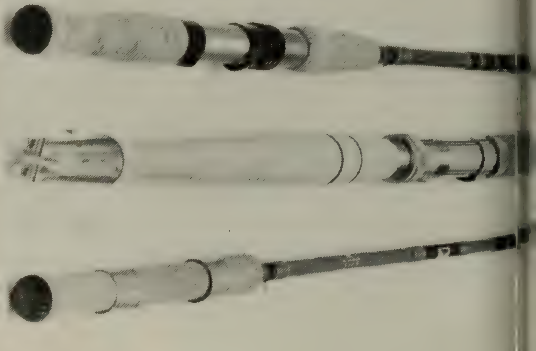
The company that originated these two reels has recently come out with an equally phenomenal magnetic fly reel. The whole reel, finely machined and hand adjusted, is built around a magnetic core which supplies both the adhesive force to hold the reel together and the drag, without any screws or other such parts to rust, corrode or drop out. The drag is so smooth that the angler who likes to fish "far and fine" can use a tippet of 5X or 6X, the equivalent of half-pound breaking strength, on the end of his leader. He can dare to fight a four- or five-pound trout with no fear that sluggishness or tightness in the reel will cause the leader to snap when the fish gets a finhold and makes a sudden surge.

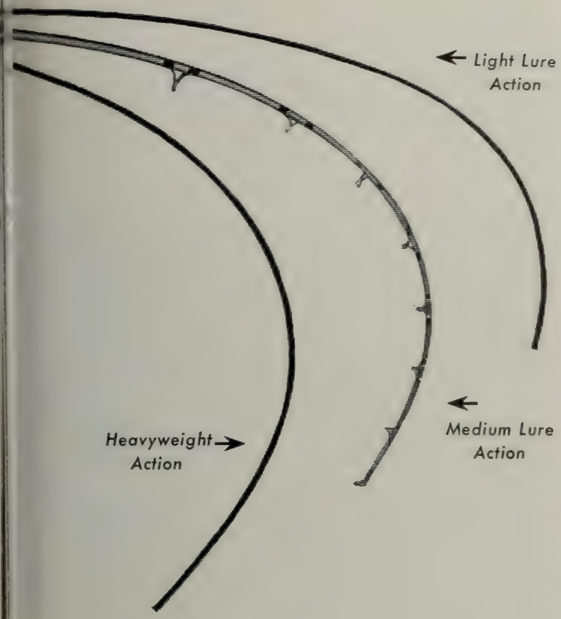
Of necessity, fishing lines have kept pace with the changes in reels. Perhaps the greatest forward step is the development of the almost invisible synthetic monofilament spinning lines, small in diameter but tremendously strong. Because they cannot see these fine lines, fish forget their natural caution and tear into a lure or bait offered in such a manner. This has been one factor in the sudden almost universal acceptance of spinning in the United States. However, the first such lines had the common fault of being so rubbery that it was almost impossible to set a hook. Barely a year ago, American manufacturers came out with a new monofilament which has all the advantages of the old plus an almost complete lack of stretch. On top of this, it has even smaller diameter for corresponding breaking strength. This is a particular advantage in the latest trend among a select group of anglers who like to add sport to their fishing by using extremely small reels and a line of 1-, 2-, 3- or 4-pound breaking strength. With such fine-diameter line it is possible to get sufficient line even on a small reel to allow for the run of a substantial fish.

Synthetics have also had considerable influence on fly lines, many of which are now coated with glass. Even in the field of heavy trolling, plain cotton or linen line is almost a thing of the past; the new monofilament is used instead. In the heavier-pound test lines, fifty pounds and up, the new and strong dacron is taking over, a fine working, tough line; the thread line of the past is rapidly on its way out.

Today wire leaders, believed by many to scare fish by their brightness, are often coated with vinyl for a finish that closely

PHOTOS. ABERCROMBIE & FITCH





resembles monofilament. And again, monofilament has brought streamlined appearance to the long, tapered leaders used by fly men; the leader can now be tapered smoothly, again providing extra invisibility.

Since the first artificial lures were carved out of chunks of wood, anglers and manufacturers have been creating fish tempters which have been described as everything from "the perfect lure" to "a lure so effective that it should be outlawed." Of course, the fact is that fish still elude anglers and manufacturers therefore still constantly keep trying for something new and different. Most surface plugs and lures for casting are now made of plastic so the weight can be readily adapted to requirements. Several of the better-known companies produce a weedless lure that has little fine wire legs that prevent the lure from becoming entangled in lily pads and so on. For safe retrieve at greater depth, an enterprising manufacturer has turned out a jig-type lure with the hook riding up so that the lure can be pulled safely over stones and stumps without much danger of being snapped. Among the best-selling lures on the market is a line of rubber worms in all shapes and sizes and many colors, to be cast by spin- or by plug-casting outfits. And an artificial shrimp has appeared, with holes punched in the body, and, inside, a package of condensed shrimp aroma to seep out and attract the fish.

Magnum rods are specially constructed to permit the fisherman to handle very light lines, lures and fish as well as big-game lines that would break ordinary rods weighing more and appearing stronger.

Not content with appeal to the eye and the sense of smell, even the hearing of the fish is being accosted with a fish caller now selling widely. The fish caller is a small cylindrical box about six inches long, housing a battery that causes a loud buzzing noise to be emitted. This noise is supposed to arouse the curiosity of the fish so that it will swim near enough to see the bait that the cunning angler is dangling nearby.

For fly fishermen, the production of new patterns has gone on since time immemorial, yet every year sees new ties that achieve sudden popularity throughout the country or even throughout the world. The most interesting development in this field is the growth of interest in "jassids," very tiny insects of various kinds in the terrestrial rather than the aquatic field. These have been researched by a small group of Pennsylvania anglers and ties of this kind developed as a completely American contribution to the top echelon of fishermen.

For those who like to tie their own flies by the stream, one manufacturer has turned out a kit of pliable plastic bodies in which the angler can insert the feathers he chooses.

SHELL COLLECTING

By MARY MOTT
Conchologist

IT is the easiest thing in the world to become a shell collector, merely by taking a walk along a sandy beach. The bright colors and interesting shapes will attract you and, before you know it, you'll be a collector. In time you will want to learn more about shells—about their varieties, the animals that live in them and even their place in history and the world of decoration.

An empty shell on the beach was once the home of an animal—a marine mollusk. The shell was grown by the mollusk for its protection, to live in and to travel about in. To protect the shell-dweller further, nature has given the shell pattern and color resembling its surroundings in deep or shallow water.

Some of these animals have one shell and are called univalves; others have two shells hinged together and are called bivalves. A familiar example of the hinged shell is the scallop shell, used for centuries in design. Often an empty shell found on the beach means that the animal inhabitant has been killed in a fight and eaten by the winner.

Shells can be found all over the world on any sandy beach. In the United States the best known shell beaches are found along the entire coast of California to the most southern tip, along the entire eastern shore, on the stretch of beach along the Gulf of Mexico, along the Florida Keys and on the west coast of Florida. The shells from the Pacific coast are apt to be more spectacular than those of the Florida coast and are found in deeper water. The best known is the abalone shell whose tenant, the abalone, is now protected by law.

To the serious conchologist—student of shells—there are two preferred hunting places, two islands off southwest Florida, Marco and Sanibel islands. Marco Island, between the towns of Naples and Everglades, is one of the group known as the Ten Thousand Islands. It is accessible by car and off the main road only a few miles. Its wild, horseshoe-shaped beach of white sand, almost untouched by civilization, is superb hunting ground for shells.

The second island is better known and is a Mecca for conchologists from all over the world, as is its neighbor, Captiva. Sanibel is reached by car ferry from a point twenty miles west of Fort Myers. It is a long narrow island, still unspoiled, with miles of lonely beaches covered with numerous kinds of interesting marine life. Sanibel is at right angles to the Florida coast and, because it extends east and west, catches on its beaches the shells washed up in tropical storms.

Shell names, alone, awaken active interest and curiosity. Angel wings, lion's paw, sunray, cockle, tulip band, nutmeg, limpet, auger, fan shell, Chinese alphabet, cowrie, lace murex, lettered olive, coquina and pecten—these are but a few of the better known ones. The popular names are easily learned and are generally used.

One simple way of finding shells is to dig right in the sand or in very shallow water, with a shovel, sieve and bucket. The best time for this is between low and high tides. The local newspapers give the times of low and high tide and also the time of full moon, which many shellers prefer. Others believe firmly that the right times for shelling are any time and all times. The main thing to remember is to collect shells the safe way; study the tides and the water depth—tides are strong and can be very dangerous. Shells are also sometimes collected by dredging, which makes it possible to bring up fine specimens inhabiting the deep waters.

When you return from your shelling

trip, sort over your shells. It may be necessary only to wash empty shells found on the beach and then set them aside to dry. Later, rub them gently with a soft cloth with baby oil on it. This treatment brightens and restores the color of the shell, giving it a lovely patina.

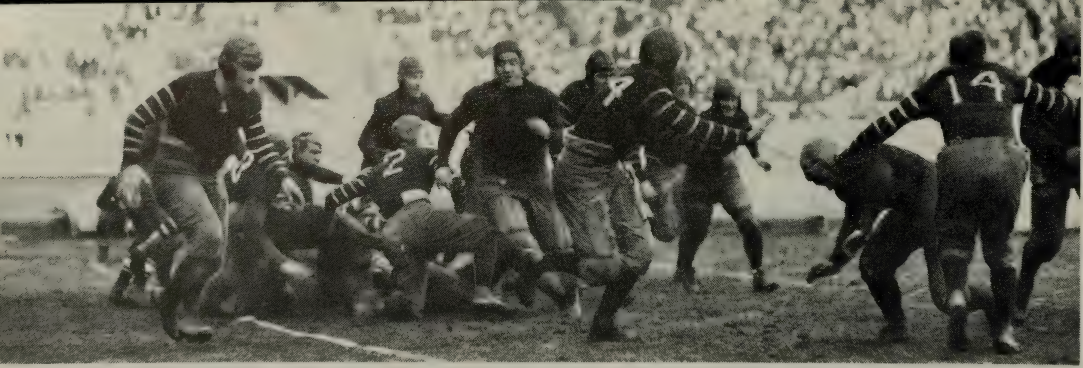
There are several ways of cleaning shells containing live animals. You can soak the shell in a solution of one part formaldehyde to ten parts of water for several days. Then wash, dry and polish. You can also remove the animal from its shell by placing it in warm water, bringing the water to a boil and allowing it to boil for five minutes. Then cool the shell so that you can handle it and with a bent piece of wire pull the animal from the shell, very carefully. If any part remains, put the shell in alcohol for several days; then dry, and there will be no odor. If there is a crust on the outside of the shell, soak in a commercial bleach until it is clean, but be careful not to use too strong a bleaching solution. Never let your shells dry in the sun and never display them in a sunny place, for fear of fading. If they do fade, wipe them with the cloth saturated in oil; this will bring back most of the color.

The last step in shell collecting is showing your shells. Here you can use your own imagination or follow the ideas of others. It is advisable to store your shells in small boxes, according to size. Matchboxes can be covered and fastened together to form little chests. Shells arranged on shelves are most attractive, too, if you first line the shelves with paper of turquoise color. This sea color brings out the tones of the shells nicely. Some collectors assemble their shells under glass on a table top or in a picture frame.

When you become a serious conchologist, you will want to classify your shells, using a card catalogue listing the place and time of finding them. You will also want to give the scientific names to your specimens.

While the professional sheller may keep his collection under cover, there is much to be said for the amateur who prefers his shells in the open. He likes to look at them, thinking of the sunny day on the beach where he found them.

SEGHERS FROM BLACK STAR

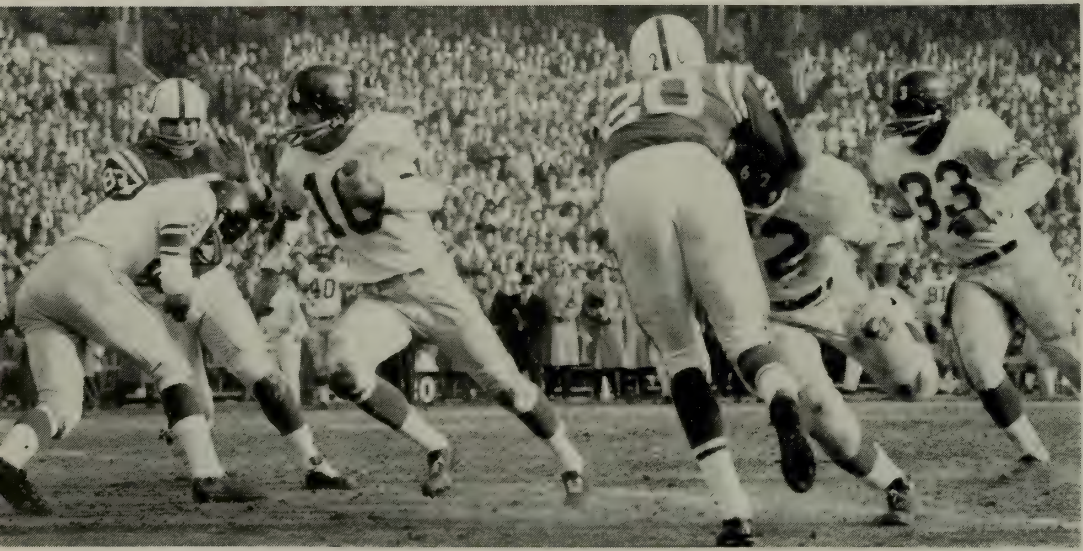


UPI

SPORT PARADE

GRIDIRON PROS

The helmets were leather, the boots were high, and professional football was rough-and-tumble back in 1921 (above). Although the modern uniform is different from head to toe, today's players indulge in the same fighting game.



WIDE WORLD

By HUGH BROWN

Sports Columnist
Philadelphia Evening Bulletin

PROFESSIONAL football is as old as the turtle-neck sweater but it did not really beguile the sporting public until shortly after World War II. Since then, pro football has doubled attendance, tripled salaries and, in a recent public pulse-feeling, was hot on the heels of professional baseball as the United States' most popular spectator sport.

The game's first faint stirring was felt way back in 1902. Connie Mack, of Philadelphia Athletics fame, "suited up" some baseball players—among them, Christy Mathewson and Rube Waddell—and his team, after it had played a ragtag schedule, laid claim to the pro gridiron championship of the world.

Although there is considerable doubt as to who formed the first professional football league, Leo Lyons, a Rochester, New York, paint-store proprietor, claims that he fathered the first league in 1919. It was called the American Professional Football Association and granted franchises to teams representing Rochester and several Ohio cities, including Canton, Akron, Dayton and Columbus. James (Jim) Thorpe, of the Carlisle Indian

School and the Canton Bulldogs, was the league's first president.

The association was succeeded in 1922 by the National Football League. George Halas, now coach and owner of the Chicago Bears, was the league's prime mover. At first the NFL was a helter-skelter affair; it started with 17 clubs and expanded to include 22. Scheduling was haphazard; one team might play 12 games and another only 5 or 6, depending upon finances and popularity. In the mid-1920's, Halas signed Harold (Red) Grange from the University of Illinois and drew the first big crowds.

The NFL was soon scaled down to 12 clubs, with Eastern and Western divisions set up for play-off purposes. The first play-off was an odd one, featuring the Chicago Bears against the Portsmouth, Ohio, Spartans. Because a blizzard gripped Chicago on the play-off day in December 1932, the game was moved indoors to the Chicago Stadium. The field was only 80 yards long instead of the regulation 100; the Bears won the game, 9 to 0, with Portsmouth disputing the score.

A comparison of the statistics of the first genuine title play-off in 1933 with the statistics of today provides a startling example of how the game has grown. Each member of the winning Chicago Bears was paid $210.34 for the game; each losing New York Giant received $140.22. In the 1959 play-off at Memorial Stadium in Baltimore, the winning Baltimore players took home $4,674.44 each, as opposed to each losing Giant's $3,083.27.

Despite the gains of the late 1920's, crowds in the 1930's were generally sparse. Although players were paid an average of only $200 a game, the clubs' owners often had difficulties meeting the payrolls.

The turning point in pro football came in 1935 when Bert Bell, then owner of the Philadelphia Eagles, succeeded in having the league adopt the college-player draft. Because professional football supports no minor-league teams, as baseball does, its source of supply has always been the college campus. The 1935 draft rule provided that the lowest teams in the standings would have first choice of the graduating college stars. This was the equalizer, forcing the league-dominating Bears, Giants, Green Bay Packers and Washington Redskins to share the talent wealth.

Bell was elected league commissioner in 1946. Under his energetic direction, pro football moved toward its present popularity. He put a stop to owners' feuds and also settled a war with the rival All-America Conference, a short-lived competitor of the NFL, which succumbed in 1949. The NFL absorbed 3 teams of the Conference. Bell ended player-raiding by Canadian professional teams; unearthed and disposed of a gambling scandal on the morning of a championship game; won a Federal suit about TV rights; and persuaded the club owners to recognize a union of the players, giving them pensions and other benefits.

Football changed a lot under Bell's rule. He used to recall the strange meanderings of his Philadelphia Eagles back in the 1930's. "We traveled by bus, slept in fleabags, and the players got $2.00 meal money," he said. "When we saw an open field on our trips, we would get out of the bus and practice."

Bell died at 65, while watching an Eagles-Pittsburgh Steelers game in Philadelphia in the middle of the 1959 season. But his work had been done so well that his successor, 33-year-old Alvin Ray (Pete) Rozelle, was able to report the eighth consecutive yearly increase in attendance for 1959. A whopping crowd of more than 3,300,000 fans watched the 12 NFL teams in action, an increase of about 157,000 over the 1958 season. The surge was all the more remarkable because in 1959 the nation was in the grip of a steel strike that paralyzed the team cities of Pittsburgh, Cleveland and Detroit.

Today the minimum salary of a professional football player is around $10,000 for the 12 games of the regular season, plus $50 for each of 6 exhibition games. Teams travel by chartered airliners; hotel accommodations and food are the

WIDE WORLD

The late Bert Bell, in the center, commissioner of the National Football League from 1946 to 1959, confers with presidents of two pro-football teams.

best. The training season alone for most teams costs the owners a minimum of $40,000. For the entire season, expenses run to more than $1,000,000 per team. Yet bonuses to players never exceed $10,000, compared to the $100,000 sometimes paid by baseball clubs to pitchers just out of high school. In the NFL championship play-off game at the end of the season, 70 per cent of the money, including the $200,000 television fee, goes to the players.

Television and radio income varies for each team, depending upon the number of stations that carry the games. The last published figure for total annual TV income was $1,719,693, which was received by the 12 teams in 1956. Bert Bell set up a television policy that is a model for the sporting world. Pro football, unlike baseball which has flooded its market with free games, allows only "away" games to be televised—to stir up interest for home games. Pro-football games are carried mainly over a national network, with a 75-mile area blacked out where the game is being played.

There is no doubt about pro football's high television rating. During the "sudden death" play-off in 1958, between the Baltimore Colts and the New York Giants, the TV audience was estimated at 45,000,000, including Canadian viewers. This was probably the largest mass audience to view any sporting event up to that time.

In March 1960 the owners of the Chicago Cardinals agreed to move their team to St. Louis. The Cardinals had for years competed with the Chicago Bears for the patronage of the Windy City. In St. Louis the football Cardinals plan to play in the baseball Cardinals' Busch Stadium until a new $24,000,000 stadium can be erected.

With one exception—Green Bay—professional football teams have never had their own playing fields. The Eagles play in the University of Pennsylvania's Franklin Field; the San Francisco 49ers make their home in Kezar Stadium; and the Los Angeles Rams, in the vast Memorial Coliseum. The other NFL clubs use stadiums built for baseball.

The NFL policy has been one of what Bell called "orderly expansion." But the emergence of a new rival, the American Football League, spurred the NFL into immediate and sudden expansion. At a meeting in January 1960 the owners voted to add a Dallas, Texas, franchise and to admit, in 1961, a Minneapolis–St. Paul team.

Among others bound to be disturbed by the advent of the American Football League are the colleges. Generally the college brand of ball cannot compete in excitement or skill with the professional game. The pros feature the pass, while the trend in college ranks has been toward the unspectacular, but safe, "grind-em-out" type of play. Since the new league plans to play most of its games on Friday and Saturday nights, it will be in direct competition with many colleges and high schools, which have been forced to play in the evening hours because of the NFL afternoon games.

A number of years have passed since professional football was considered a somewhat shabby postgraduate occupation. Bert Bell continually emphasized that the player should cast about for profitable off-season work that could become a lifetime career. The result is that an annual income of, say, at least $18,000 ($10,000 for football, $8,000 for another job) is the rule rather than the exception. This brings up the question: How many intellectuals earn that much the first year out of college? Alas, not very many. But then the egghead does not get his fibula fractured, either.

Big BOOM in Bowling

By JOE WILMAN

Champion Bowler

DURING the 1959 meeting between President Eisenhower and Russia's Premier Khrushchev at Camp David, Maryland, the Premier expressed his interest in seeing the bowling lanes at the camp's recreation center. His introduction to the most popular competitive sport in the United States was a fitting part of Mr. Khrushchev's first eyewitness examination of the American way of life.

Bowling's gigantic boom in popularity was a long time in coming, but now it dominates the American recreation scene for millions of people, and no slackening of the game's growth is in sight. An estimated 26,000,000 participants—nearly half of them women and youngsters—are active in this sport in the United States alone. In 1955 the number of players was closer to 15,000,000. Last year the nation's bowlers kept 90,000 lanes humming in 8,500 establishments, while only about half as many lanes were available in 1950.

Bowling is a venerable game. Crude implements of the sport have been discovered in a 2,000-year-old Egyptian tomb. Sir Francis Drake was busily playing lawn bowls, an outdoor variant of the game, when he was informed of the close approach of the Spanish Armada. (Lawn bowls was a popular sport with the first settlers in America.) Bowling (or tenpins), as it is usually known in the United States today, is played with composition balls that weigh between 10 and 16 pounds. Holes bored in these balls allow the player to grasp them with the thumb and one or two fingers. The general object of play is to bowl over as many as possible of the 10 wooden pins, each 15 inches high, which are placed in a triangular form at the end of the bowling lane, 60 feet from the player.

In the early nineteenth century, gambling became widely associated with bowling, which at that time was played with nine pins and was known as ninepins. As a result, the legislatures of New York, Connecticut and Massachusetts banned the game. After the Civil War it was played with ten pins instead of nine; in this way players were able to circumvent the ban of the legislatures, which was only against ninepins.

For years the game was generally associated with saloons and their patrons and was played under an odd assortment of rules and with a variety of homespun equipment. Then, in 1895, bowling took a big step forward with the formation of

Since bowling is a sport for people of all ages, the entire family, from grandfather down to the youngsters, can join in the fun of bowling together.

BRUNSWICK-BALKE-COLLENDER

the American Bowling Congress. This organization gave its official sanction to competition only if standard rules were observed and playing equipment met exacting specifications. The first ABC national tournament was held in 1901. Bowling at that time was almost entirely a masculine diversion, and there were many more spectators than players.

Enthusiasm for bowling today is not confined to the United States but is spreading rapidly throughout the world. Largely because of the fervor of servicemen at American foreign military installations, modern bowling centers are springing up in various parts of Europe —in England and Scandinavia, for instance—and in Latin America and Australia. A five-pin version of the sport is becoming popular in Canada.

One reason for the phenomenal growth of the game was the introduction in 1953 of automatic pin setting. This freed bowlers from dependence on an unpredictable supply of pin boys who had formerly been employed to set up the pins. With the automatic device, bowling is possible at all times, and some bowling centers remain open all night long.

Television often shows bowling's big-league champions in action. The game's great performers—Steve Nagy, Ned Day, Andy Varipapa, Don Carter, Buzz Fazio and others—brought bowling to major sports stature through televised competition and world-wide exhibition matches and instruction sessions. In more recent years, network-television coverage has been focused on two of the sport's greatest competitive events, the World's Invitational Tournament and the National Match-Game Tournament.

More than 250,000 boys and girls bowl under the sanction of the American Junior Bowling Congress, and many thousands more bowl casually or as a part of high-school physical-education programs. Bowling lanes are installed in many college student-union recreation centers. The sport is a favorite in intramural athletics and in college-conference and intercollegiate competition.

More than 3,000,000 men bowl in leagues sanctioned by the American Bowling Congress. Lodges, clubs, churches and business establishments sponsor teams, and the National Industrial Recreation Association lists bowling as a top choice of companies sponsoring employee sports activities. The Woman's International Bowling Congress has a membership of about a million, but five times that many women are among the nation's "just-for-fun" bowlers. Bowling activity for women, principally during the daytime hours, ranges from regulation league play to informal neighborhood outings.

Where do people bowl? They may enjoy the sport in the world's largest bowling center—the Edison, New Jersey, lanes, where 112 lanes in a row stretch the length of two football fields. Or they may bowl at less pretentious 10- or 12-lane establishments. But, wherever it is, the typical modern bowling center furnishes a bright, attractive setting for the

PHOTOS, BRUNSWICK-BALKE-COLLENDER

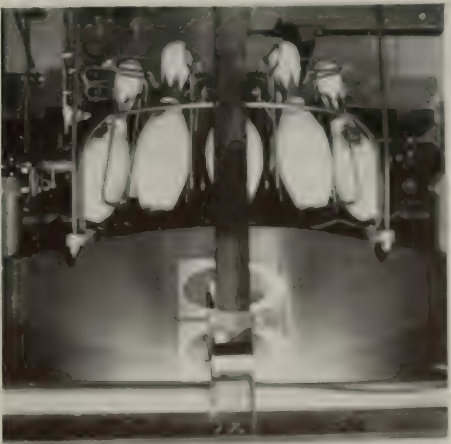
game. There is often a restaurant or snack bar, a meeting or banquet room and, more likely than not, a supervised nursery with free baby-sitting service for the convenience of bowling mothers.

Some enterprising proprietors have added unusual twists. A Moberly, Missouri, proprietor built a laundromat adjoining his bowling center; in Dallas, Texas, the Cotton Bowling Palace has a barbershop and beauty parlor open around the clock. Many bowling centers are used at times for community activities and thus play an important part in the life of a city or town. The Omaha Symphony Orchestra, for instance, conducts its weekly rehearsals in the Ranch Bowl's meeting room, and a Roman Catholic parish without a church also has free use of the room. The North Kansas City (Missouri) Bowl has an aviary and an art gallery in its foyer. Orchard Twin Bowl in Skokie, Illinois, employs a full-time sociologist to plan a variety of community activities around the bowling program. Plans have been announced for a giant domed structure near Madison, Wisconsin, to house forty-eight bowling lanes, a swimming pool, a skating rink and a gun and archery range.

Why do people bowl? In the first place the game offers competition and a challenge for the player to improve. Youngsters love the game because they can give vent to their exuberant energy on bowling lanes and because it provides spirited competition for those without extraordinary athletic ability. At the opposite age range a nationwide Seniors Bowling Association has been formed exclusively for tenpin enthusiasts more than 50 years of age. One member of the Chicago Seniors League is 93. Bowling champion Andy Varipapa at 68 is still a topflight exhibition star. Champion Buzz Fazio, who weighs only 140 pounds, is the idol of bowlers who have learned that they need not be handicapped by slight build. Those with physical infirmities often find bowling their only possible physical exercise. There is competition, even on the national level, for blind bowlers, and, with certain necessary adjustments in style, amputees often bowl with considerable prowess.

Bowling is officially recognized for its contribution to physical fitness. Dr. Herman Bundesen, president of Chicago's Board of Health, says "The physical benefits of bowling are real and positive." Mrs. Marion Ladewig, top winner among women bowlers on the American scene, has pointed out that bowling consumes more calories than are used up in an equal period of time in playing tennis or mopping the floor. Aside from any other benefits, however, bowlers all over the world bowl because it is fun.

←
Edison Lanes in Edison, New Jersey, is the largest bowling center in the world, with 112 lanes lined up in an unbroken row that extends the length of two football fields.



→
The automatic pin-setting machine, which frees the owner of a bowling center from reliance upon an unpredictable supply of pin boys, has given an impetus to bowling.

SPORT
PARADE

JUDO Has Them Flipping

By BEDFORD BUNDY

Free-Lance Writer

TEN years ago, judo was little known in North America, but it is now increasing in popularity faster than any other sports activity. It is sometimes described as an Oriental form of wrestling and involves turning your opponent's strength against himself. (If, for instance, he charges full-force toward you, you can use the energy of his onward rush to help you toss him over your shoulder.) Judo was originally introduced into the United States in the very early years of the twentieth century, but it was not widely practiced there at that time. During World War II, American soldiers stationed in Japan rediscovered the sport. Today it is being taught in colleges and universities, at Y.W.C.A.'s and Y.M.C.A.'s, in athletic clubs and in judo schools in the United States and Canada. It has achieved the status of an intercollegiate sport on the West Coast, and eight national judo competitions have been held in the United States. The Olympic Association has even been considering the sport as one of the Olympic games.

Judo evolved from jujitsu, which had its origins in the Orient about two thousand years ago. Experts believe that it was taken to Japan from China by masters of the art. The story goes that Buddhist monks were in need of defense against armed bandits who plundered their harvests and destroyed their means of livelihood. In their attempts to cope with these marauders the monks gradually developed the art of self-defense that came to be known as jujitsu. This technique, which eventually often resulted in extreme brutality and the crippling of the opponents, was an accepted means of self-defense in Japan for many centuries, although it was later frowned upon.

MARVIN E. NEWMAN

Judo is not only a sport but also serves for self-defense. Above, a girl who weighs only 70 pounds throws a 240-pound instructor over her head.

In 1882 a young Japanese educator, Jigoro Kano, developed judo—"the art of the giving way"—from some of the less brutal aspects of jujitsu. He founded a school, the Kadokan, in Tokyo, where this art was taught. Although judo is primarily regarded as a sport it also serves excellently as a means of self-defense. Combat judo was taught to many soldiers in World War II and certain of its skills have proved extremely useful to law enforcement officers.

Judo is a thinking sport in which mind and body work in unison, and its objectives are stated as body development, contest skill and mental and moral development. Courtesy is inherent in the sport; both students and instructors bow formally on entering class, on starting to compete, after a victory and on leaving. Patience, too, is required. Judo is an art and it takes time and practice to learn its holds, stances, throws and falls. The novice must be prepared to take a minimum of one lesson a week for nine months to learn the fundamentals—two or three years to acquire real skill.

Men and women of all ages, teen-agers and children are included among American participants in the sport. Every major city in the United States has at least one judo group and each state has at least 4 groups and some have as many as 30. Karl Geis, who has one of the finest schools in Texas, says that there are 20 clubs in the Southwest. The total membership in the United States is now about 15,000, and it has been estimated that there are more than 25,000,000 participants throughout the world.

The greatest American interest in the new sport has sprung up on the West Coast, probably because Vancouver, Seattle and San Francisco are centers of Oriental settlement, but the interest in judo is moving steadily eastward. The Air Force Academy in Colorado has offered judo as a physical education course for five years and its judo club competes with Y.M.C.A. and other judo groups in the state. Judo was introduced at the University of Missouri during the 1959–60 school year, and at the University of Toronto 250 students are enrolled in judo activities. On the East Coast, Yale students practice judo on an informal basis, as do some at Harvard, where a club of 17 members was formed in December 1959.

The National Council of Y.M.C.A.'s of Canada reports that judo has replaced weight training as its fastest-growing sport. One third of the Canadian Y's now teach it and the rules were added to their athletic handbook in 1960.

There are judo classes in 10 of New York City's 14 Y.M.C.A.'s and 300 spectators attended an inter-Y judo competition in 1960. In Chicago about 50 women from 17 to 60 years of age take lessons at the central Y.W.C.A. and there are classes in many other Y.W.C.A.'s on both sides of the border.

Finding enough teachers of judo for colleges, where all instructors must have college degrees, and for classes in the Y.M. and Y.W.C.A.'s poses a problem. Experts prefer to run private schools where they can teach 50 to 500 students at $2.50 to $5 a lesson, giving each student one to 3 lessons a week.

Whether in school or in competition, judo participants usually wear a loose costume called a judogi (ghee for short) which costs from $12 to $15. With it they may wear broad belts which designate their rank—white for beginners, then yellow, green, brown and, finally, the black belt of the expert.

The National A.A.U. controls judo in the United States. Meets are held by districts, which are organized under the Judo Black Belt Federation of the United States. The official governing body in Canada is the Canadian Judo Federation.

In competition a group usually sends a team of five men for dual meets, in which there are no weight divisions and where one man holds the mat for as long as he can. When he is defeated a teammate goes in. The team with an undefeated man is the victor. Weight is a factor, however, in tournaments. The divisions are 130 pounds and under, 130 to 150 pounds, 150 to 180, and over 180. A champion is determined for each division and then these champions compete to determine the over-all winner. There are five ways to defeat an opponent: by a clean throw onto his back; by choking him until he admits defeat or starts to lose consciousness; by a joint lock (such as an arm lock) that forces him to give up; by holding him on his back in a recognized hold for a specified time; or by decision of the referee.

Sports Pictures of 1960

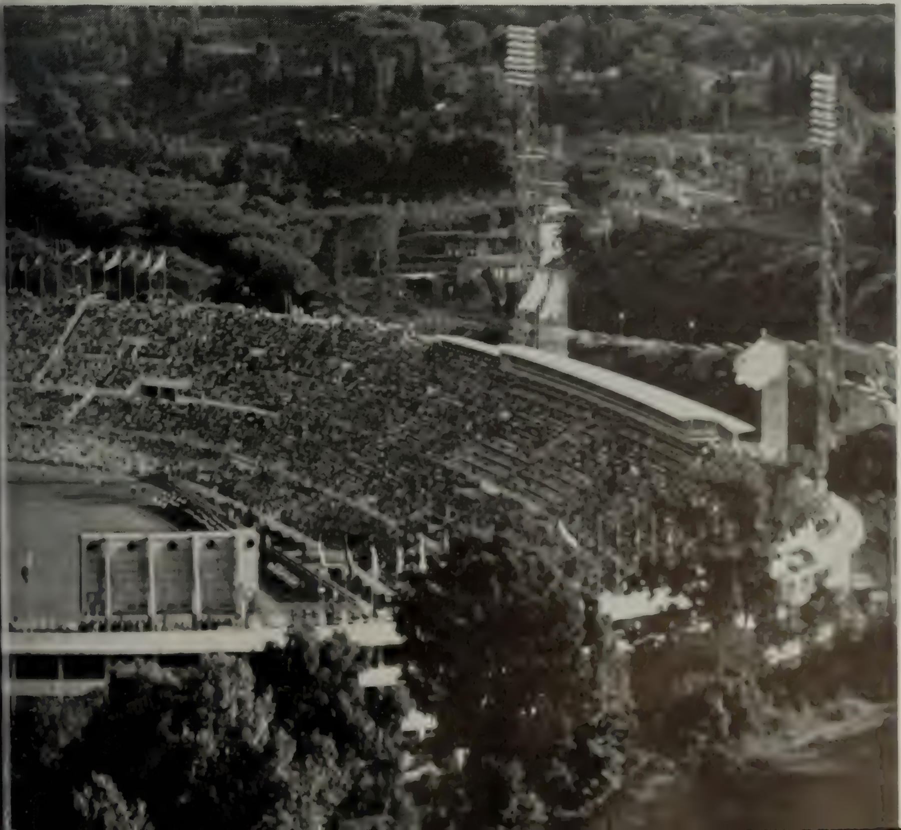
In an exciting contest between the Canadiens and Rangers, Canadien goalie Jacques Plante (1) blocks a Rangers' shot.

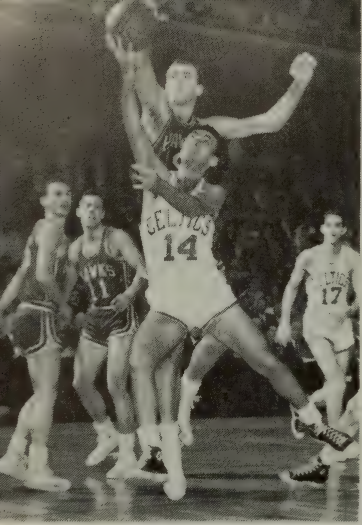
Crowds jam the main stadium during the Olympic games, held against the magnificent backdrop of Rome.

The yawl Finisterre, sails billowing, glides across the finish line to win the Newport-to-Bermuda yacht race.

Moment of triumph: second baseman Bill Mazeroski rounds third base, clinching the World Series for the Pittsburgh Pirates.

PIX

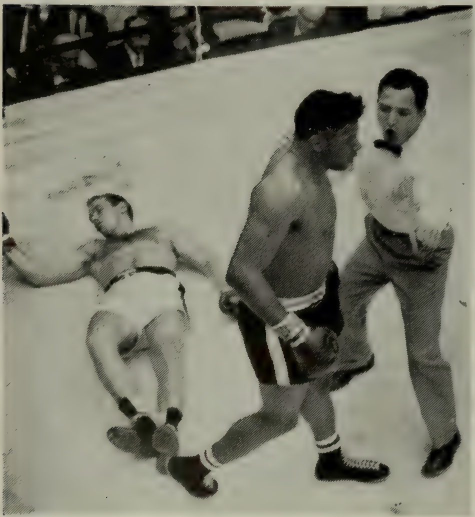




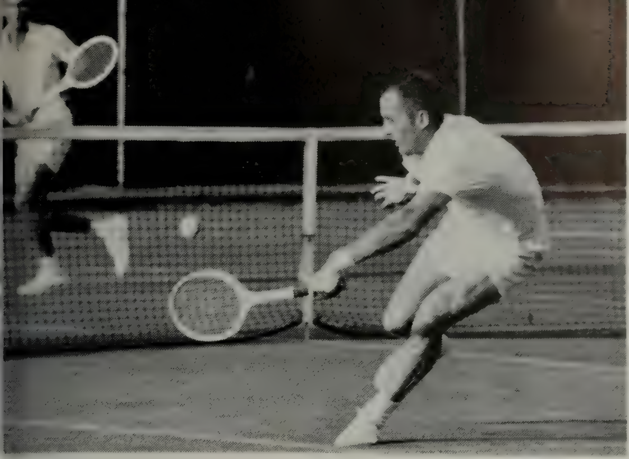
Basketball battle: in a dramatic leap, St. Louis Hawks player Bob Pettit spoils a scoring attempt by Bob Cousy of the Boston Celtics.

UPI

Canadian Anne Heggtveit zooms down Papoose Peak to win the Women's Slalom during the winter Olympics held at Squaw Valley, California.



Floyd Patterson KO's his Swedish rival Ingemar Johansson to win back the world heavyweight title.

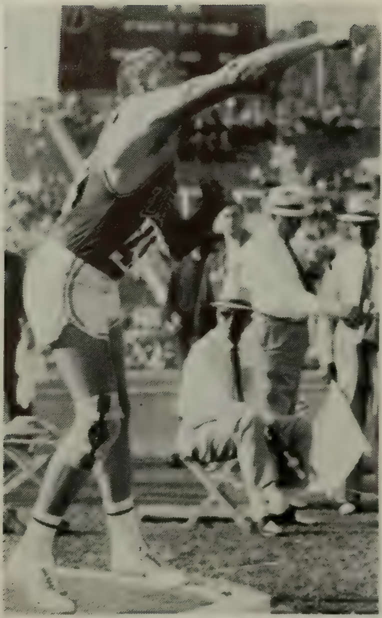

UPI

The Australian tennis star Neale Fraser captured the United States and Wimbledon singles and helped clinch the Davis Cup.

American Wilma Rudolph gets off fast. She won the 200-meter dash in the Olympic-record time of 0:24 seconds.

Olympic decathlon victor Rafer Johnson receives his gold medal from Avery Brundage.

Jay Hebert, here blasting his way out of a sand trap, won the National Professional Golf Association championship with a 72-hole total of 281.



Army Lieutenant Bill Nieder tosses the shot-put that captured the Olympic title.

UPI

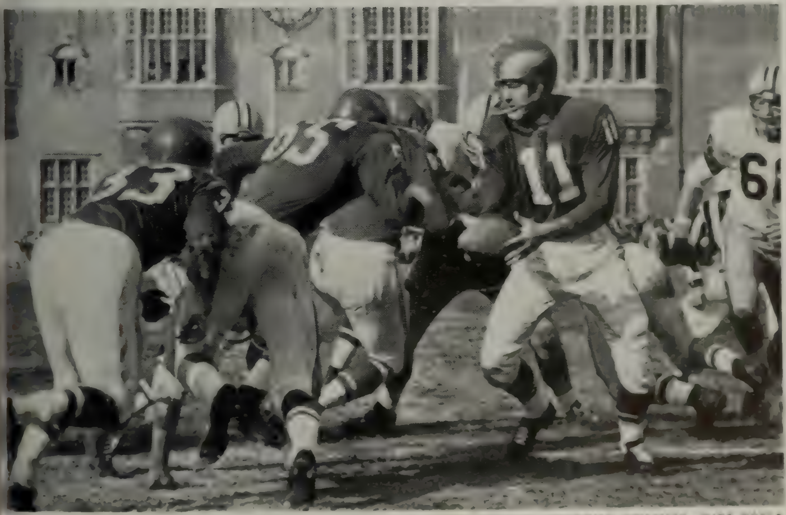
With three feet in the air, Kentucky Derby winner Venetian Way leaps finish line.

Bowling stars and their trophies: Marion Ladewig and Don Carter, victors at Chicago invitational tourney.

In classic form, Bill Mulliken, member of the American swimming team, carried off the Olympic crown for the 200-meter breast stroke.

Champion Olympic woman diver Ingrid Kramer of Germany spins through a turn.

Lynn Burke of the American team broke an Olympic record in 100-meter backstroke.



ALL PHOTOS, UNLESS OTHERWISE SPECIFIED, WIDE WORLD

Norm Van Brocklin (11) helps Philadelphia Eagles take National League title.

Rose Bowl: Bob Schloredt leads Washington University to victory over Minnesota.

WORLD TRAVEL

EXPENDITURES BY FOREIGN VISITORS IN THE UNITED STATES

(Millions of Dollars)

COUNTRY OR AREA OF ORIGIN	1949	1951	1953	1955	1957	1959
Canada	165	246	307	364	419	462
Mexico	68	75	101	110	135	160
Other Latin America	76	81	84	87	100	133
Europe and the Mediterranean area	52	37	41	61	87	98
All other countries	31	34	41	32	44	49
TOTAL	392	473	574	654	785	902

EXPENDITURES IN OTHER COUNTRIES FOR TRAVEL BY UNITED STATES RESIDENTS

(Millions of Dollars)

COUNTRY OR AREA OF TRAVEL	1949	1951	1953	1955	1957	1959
Canada	265	255	282	306	340	365
Mexico	155	194	226	255	305	350
Europe and the Mediterranean area	185	195	306	430	483	604
Bermuda, West Indies and Central America	57	75	76	107	153	174
South America	21	25	20	22	37	41
All other countries	17	13	19	33	54	76
TOTAL	700	757	929	1,153	1,372	1,610

SOURCE: United States Department of Commerce

TRAVEL REGULATIONS FOR TOURISTS

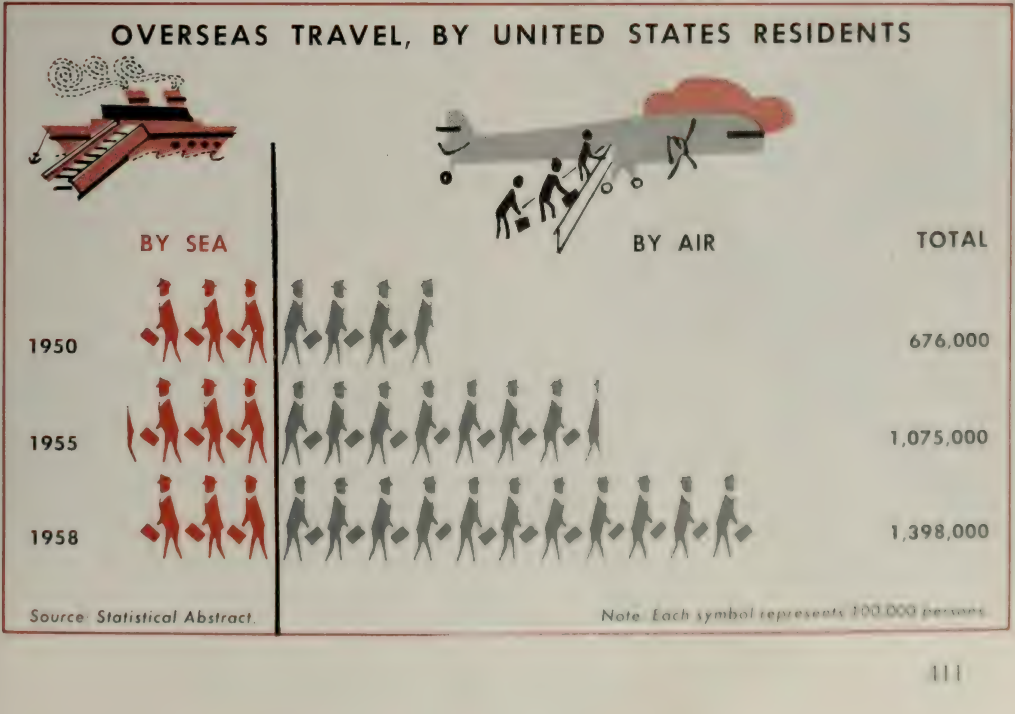
EUROPE

COUNTRY	PAPERS	CURRENCY RESTRICTIONS
Austria	Passport, no visa for three months	No limit on schillings in, 10,000 out
Belgium	Passport, no visa for two months	None
Czechoslovakia	Passport, visa, fee $6, 3 pictures	No crowns in or out
Denmark	Passport, no visa for three months	500 kroner in or out
Finland	Passport, no visa for three months	20,000 marks in or out
France	Passport, no visa for three months	No limit on francs in, 200 (new) out
Great Britain	Passport, no visa	50 pounds out
Greece	Passport, no visa for two months	450 drachmas in or out
Iceland	Passport, visa with one picture	No krónur in or out
Ireland	Passport, no visa	None
Italy	Passport, no visa for three months	No limit in, 50,000 liret ou
Luxembourg	Passport, no visa for two months	None
Netherlands	Passport, no visa	1,000 guilders in or out
Norway	Passport, no visa for three months	1,000 kroner in, 350 out
Poland	Passport, visa, fee $9.90, 3 pictures	No zlotys in or out
Portugal	Passport, no visa	None
Rumania	Passport, visa, fee $5, 5 pictures	No lei in or out
Soviet Union	Passport, visa, no fee, valid up to 30 days, 2 pictures	No rubles in or out
Spain	Passport, no visa for six months	10,000 pesetas in, 2,000 out
Sweden	Passport, no visa for three months	1,000 kroner in or out
Switzerland	Passport, no visa for three months	None
Turkey	Passport, no visa for three months	200 lire in or out
West Germany	Passport, no visa for three months	None
Yugoslavia	Passport, visa, fee $1, 2 pictures, valid one month (visa at border, no pictures, fee $1.50)	3,000 dinars in or out

COUNTRY	PAPERS
Argentina	Passport, no visa up to ninety days
Bolivia	Passport, no visa up to ninety days
Brazil	Passport, tourist card from transportation company, valid 30–60 days, 2 pictures (no charge), return ticket
Chile	Passport, no visa for three months
Colombia	Proof of nationality, or passport, tourist card, no fee, 2 pictures, valid 90 days for multiple entry within 4 years, return ticket
Costa Rica	Tourist card for 30 days, fee $2 for 30 days, entry to be within 90 days of issue, return ticket
Dominican Republic	Passport, or proof of nationality, tourist card from transportation company, fee $2.24, valid 15–60 days
Ecuador	Passport, tourist card, fee $1, valid 90 days, 3 pictures, proof of trip from transportation company or return ticket
El Salvador	Proof of nationality, tourist card valid 30 days, one picture, no fee
Guatemala	Passport, or proof of citizenship, tourist card for 6 months, to be used within 60 days of issue, fee $2
Haiti	Passport, or proof of citizenship for tourist card issued on arrival, fee $1, valid 30 days for multiple entries within two years, return ticket
Honduras	Passport, or proof of citizenship, tourist card, valid 90 days, fee $2
Mexico	Proof of citizenship, no passport for tourist card, fee $3, valid for 6 months
Nicaragua	Passport, visa valid 30 days, no fee, 2 pictures, letter from transportation company, police certificate, health certificate
Panama	Proof of citizenship for tourist card, 2 pictures, fee $1, valid for 15 days, return ticket
Paraguay	Passport, visa, fee $.50, valid for 6 months, police certificate or letter of reference from business firm, health certificate
Peru	Passport, tourist card on arrival, fee $2, valid for 90 days
Uruguay	Passport, no visa
Venezuela	Passport, or birth certificate for tourist card valid for 30 days, 4 pictures, letter from employer stating this is a pleasure trip, return ticket

NOTE: Although these data were correct at the time they were compiled, there may have been minor changes since this book went to press. For up-to-date information consult local consulates or transportation companies.

SOURCE: *New York Times*


OVERSEAS TRAVEL, BY UNITED STATES RESIDENTS

Source: Statistical Abstract.

Note: Each symbol represents 100,000 persons

THE 1960 WINTER OLYMPIC GAMES

Gold Medal Winners at the Winter Olympics in Squaw Valley, California, February 18–28

FIGURE SKATING

Men—David Jenkins, U. S., 1,440.2 points
Women—Carol Heiss, U. S., 1,500.1 points
Pairs—Robert Paul and Barbara Wagner, CANADA, 80.4 points

SKIING

Men's Slalom—Ernst Hinterseer, AUSTRIA, 2:08.9
Men's Giant Slalom—Roger Staub, SWITZERLAND. 1:48.3
Men's Downhill—Jean Vuarnet, FRANCE, 2:06
Men's 15-Kilometer Cross-country—Hakon Brusveen, NORWAY, 51:55.5
Men's 30-Kilometer Cross-country—Sixten Jernberg, SWEDEN, 1:51:03.9
Men's 50-Kilometer Cross-country—Kalevi Hamalainen, FINLAND, 2:59:06.3
Men's 40-Kilometer Cross-country Relay—FINLAND, 2:18:45.6
Men's Nordic Combined—Georg Thoma, GERMANY, 457.952 points
Men's 80-Meter Jumping—Helmut Recknagel, GERMANY, 227.2 points
Men's Biathlon—Klas Lestander, SWEDEN, 1:33:21.6
Women's Slalom—Anne Heggtveit, CANADA, 1:49.6
Women's Giant Slalom—Yvonne Ruegg, SWITZERLAND, 1:39.9
Women's Downhill—Heidi Beibl, GERMANY, 1:37.6
Women's 10-Kilometer Cross-country—Marija Gusakova, SOVIET UNION, 39:46.6
Women's 15-Kilometer Cross-country Relay—SWEDEN, 1:04:21.4

Russian Lidiya Skoblikova winning the ladies' speed-skating contest.

BOTH PHOTOS, WIDE WORLD

Jean Vuarnet of France, men's downhill winner.

SPEED SKATING

Men's 500 Meters—Yevgeni Grishin, SOVIET UNION, 0:40.2 *
Men's 1,500 Meters—Yevgeni Grishin, SOVIET UNION, *and* Roald Edgar Aas, NORWAY (*tie*) 2:10.4
Men's 5,000 Meters—Viktor Kosichkin, SOVIET UNION, 7:51.3
Men's 10,000 Meters—Knut Johannesen, NORWAY, 15:46.6 †
Women's 500 Meters—Frau Helga Haase, GERMANY, 0:45.9
Women's 1,000 Meters—Klara Guseva, SOVIET UNION, 1:34.1
Women's 1,500 Meters—Lidiya Skoblikova, SOVIET UNION, 2:25.2 †
Women's 3,000 Meters—Lidiya Skoblikova, SOVIET UNION, 5:14.3

ICE HOCKEY

Team—UNITED STATES, won 5, lost 0

Unofficial Team Scores

	GOLD MEDALS	POINTS		GOLD MEDALS	POINTS
SOVIET UNION	7	165½	FRANCE	1	27
SWEDEN	3	71½	SWITZERLAND	2	26½
UNITED STATES	3	71	POLAND	0	16
GERMANY	4	70½	ITALY	0	15½
FINLAND	2	59½	NETHERLANDS	0	11
NORWAY	3	53	CZECHOSLOVAKIA	0	11
AUSTRIA	1	35½	JAPAN	0	6½
CANADA	2	32	BRITAIN	0	2

(*Based on 10 points for each first place, 5 for each second, 4 for third, 3 for fourth, 2 for fifth and 1 for sixth*)

* TIES WORLD RECORD. † WORLD RECORD.

THE 1960 SUMMER OLYMPIC GAMES

Gold Medal Winners at the Games of the XVII Olympiad in Rome, Italy, August 25–September 11

BASKETBALL

Team—UNITED STATES

BOXING

Flyweight—Guyla Torok, HUNGARY
Bantamweight—Oleg Grigoryev, SOVIET UNION
Featherweight—Francesco Musso, ITALY
Lightweight—Kazimierz Pazdzior, POLAND
Light Welterweight—Bohumil Nemececk, CZECHOSLOVAKIA
Welterweight—Giovanni Benvenuti, ITALY
Light Middleweight—Wilbert McClure, UNITED STATES
Middleweight—Eddie Crook, UNITED STATES
Light Heavyweight—Cassius Clay, UNITED STATES
Heavyweight—Francesco de Piccoli, ITALY

CANOEING, MEN

1,000-Meter Kayak Singles—Erik Hansen, DENMARK
1,000-Meter Kayak Doubles—Gert Fredricsson and Sven Sjodelius, SWEDEN
2,000-Meter Kayak Relay—GERMANY
1,000-Meter Canadian Singles—Gianos Parti, HUNGARY
1,000-Meter Canadian Doubles—Leonid Geyshter and Sergi Makarenko, SOVIET UNION

CANOEING, WOMEN

500-Meter Kayak Singles—Antonina Seredina, SOVIET UNION
500-Meter Kayak Doubles—Maria Shubina and Antonina Seredina, SOVIET UNION

CYCLING

Individual Road Race—Viktor Kapitonov, SOVIET UNION
Team Road Race—ITALY
1,000-Meter Time Trial—Sante Gaiardoni, ITALY
2,000-Meter Tandem—Giuseppe Bechetto and Sergio Bianchetto, ITALY
1,000-Meter Scratch—Sante Gaiardoni, ITALY
4,000-Meter Team Pursuit—ITALY

EQUESTRIAN

Three-Day Event, Team—AUSTRALIA
Three-Day Event, Individual—Lawrence Morgan, AUSTRALIA
Prix des Nations—GERMANY
Individual Jumping—Raimondo d'Inezo, ITALY
Grand Prix de Dressage—Sergei Filatov, SOVIET UNION

FENCING, MEN

Individual Foil—Viktor Jdanovich, SOVIET UNION
Team Foil—SOVIET UNION
Individual Epée—Giuseppe Delfino, ITALY
Team Epée—ITALY
Individual Saber—Rudolph Karpati, HUNGARY
Team Saber—HUNGARY

FENCING, WOMEN

Individual Foil—Adelheid Schmid, GERMANY
Team Foil—SOVIET UNION

FIELD HOCKEY

Team—PAKISTAN

GYMNASTICS, MEN

Team—JAPAN
All-Round Individual—Boris Shakhlin, SOVIET UNION
Free Standing—Nobuyuki Aihara, JAPAN
Long Horse Vault—Tie: Takashi Ono, JAPAN; and Boris Shakhlin, SOVIET UNION
Parallel Bars—Boris Shakhlin, SOVIET UNION
Horizontal Bar—Takashi Ono, JAPAN
Side (Pommelled) Horse—Tie: Eugen Ekman, FINLAND; and Boris Shakhlin, SOVIET UNION
Flying Rings—Albert Asarian, SOVIET UNION

GYMNASTICS, WOMEN

Team—SOVIET UNION
All-Round Individual—Larisa Latynina, SOVIET UNION
Long Horse Vault—Margarita Nikolaeva, SOVIET UNION
Parallel Bars—Polina Astakhova, SOVIET UNION
Beam—Eva Bosakova, CZECHOSLOVAKIA
Free Standing—Larisa Latynina, SOVIET UNION

MODERN PENTATHLON

Individual—Ferenc Nemeth, HUNGARY
Team—HUNGARY

ROWING

Eight-oared—GERMANY
Fours with Coxswain—GERMANY
Fours without Coxswain—UNITED STATES
Pairs with Coxswain—GERMANY
Pairs without Coxswain—SOVIET UNION
Double Sculls—CZECHOSLOVAKIA
Single Sculls—Vyacheslav Ivanov, SOVIET UNION

SHOOTING

Free Rifle—Hubert Hammerer, AUSTRIA
Free Pistol—Alexei Gustchin, SOVIET UNION
Trapshooting—Ion Dumitrescu, RUMANIA
Small-Bore Rifle (Three Positions)—Viktor Shamburkin, SOVIET UNION
Small-Bore Rifle (Prone)—Peter Kohnke, GERMANY
Rapid-Fire Pistol—Bill McMillan, UNITED STATES

SOCCER

Team—YUGOSLAVIA

SWIMMING, MEN

100-Meter Free Style—John Devitt, AUSTRALIA, 0:55.2 (OLYMPIC RECORD)
400-Meter Free Style—Murray Rose, AUSTRALIA, 4:18.3 (OLYMPIC RECORD)
1,500-Meter Free Style—John Konrads, AUSTRALIA, 17:19.6 (OLYMPIC RECORD)
100-Meter Back Stroke—Dave Theile, AUSTRALIA, 1:01.9 (OLYMPIC RECORD)

SUMMER OLYMPIC GAMES (cont.)

200-Meter Butterfly—Mike Troy, United States, 2:12.8 (world record)
200-Meter Breast Stroke—Bill Mulliken, United States
400-Meter Medley Relay—United States, 4:05.4 (world record)
800-Meter Free-Style Relay—United States, 8:10.2 (world record)
Springboard Dive—Gary Tobian, United States
Platform Dive—Bob Webster, United States

SWIMMING, WOMEN

100-Meter Free Style—Dawn Fraser, Australia, 1:01.2 (olympic record)
400-Meter Free Style—Chris von Saltza, United States, 4:50.6 (olympic record)
100-Meter Back Stroke—Lynn Burke, United States
100-Meter Butterfly—Carolyn Schuler, United States, 1:09.5 (olympic record)
200-Meter Breast Stroke—Anita Lonsbrough, United Kingdom, 2:49.5 (world record)
400-Meter Medley Relay—United States, 4:41.1 (world record)
400-Meter Free-Style Relay—United States, 4:08.9 (world record)
Springboard Dive—Ingrid Kramer, Germany
Platform Dive—Ingrid Kramer, Germany

TRACK AND FIELD, MEN

100-Meter Dash—Armin Hary, Germany, 0:10.2 (equals olympic record)
200-Meter Dash—Livio Berruti, Italy, 0:20.5 (olympic record, equals world record around curve)
400-Meter Dash—Otis Davis, United States, 0:44.9 (world record)
800-Meter Run—Peter Snell, New Zealand, 1:46.3 (olympic record)
1,500-Meter Run—Herb Elliott, Australia, 3:35.6 (world record)
5,000-Meter Run—Murray Halberg, New Zealand
10,000-Meter Run—Pyotr Bolotnikov, Soviet Union, 28:32.2 (olympic record)
Marathon—Abebe Bikila, Ethiopia
110-Meter High Hurdles—Lee Calhoun, United States
400-Meter Hurdles—Glenn Davis, United States, 0:49.3 (olympic record)
3,000-Meter Steeplechase—Zdzislaw Krzyszkowiak, Poland, 8:32.4 (olympic record)
20,000-Meter Walk—Vladimir Golubnichi, Soviet Union
50,000-Meter Walk—Donald Thompson, United Kingdom, 4:25:30 (olympic record)
400-Meter Relay—Germany, 0:39.5 (equals world record)
1,600-Meter Relay—United States, 3:02.2 (world record)
Decathlon—Rafer Johnson, United States, 8,392 points (olympic record)
High Jump—Robert Shavlakadze, Soviet Union, 7 feet, 1 inch (olympic record)
Broad Jump—Ralph Boston, United States, 26 feet, 7¾ inches (olympic record)
Hop, Step and Jump—Jozsef Schmidt, Poland, 55 feet, 1¾ inches (olympic record)
Pole Vault—Don Bragg, United States, 15 feet, 5⅛ inches (olympic record)
Shot Put—Bill Nieder, United States, 64 feet, 6¾ inches (olympic record)
Discus Throw—Al Oerter, United States, 194 feet, 2 inches (olympic record)
Hammer Throw—Vasily Rudenkov, Soviet Union, 220 feet, 1⅝ inches (olympic record)
Javelin Throw—Viktor Tsibulenko, Soviet Union

TRACK AND FIELD, WOMEN

100-Meter Dash—Wilma Rudolph, United States
200-Meter Dash—Wilma Rudolph, United States
80-Meter Hurdles—Irina Press, Soviet Union
800-Meter Run—Ludmila Shevcova, Soviet Union, 2:04.3 (equals world record)
400-Meter Relay—United States
Shot Put—Tamara Press, Soviet Union, 56 feet, 9⅞ inches (olympic record)
Discus Throw—Nina Ponomareva, Soviet Union, 180 feet, 8¼ inches (olympic record)
Javelin Throw—Elvira Ozolina, Soviet Union, 183 feet, 8 inches (olympic record)
High Jump—Iolanda Balas, Rumania, 6 feet, ¾ inch (olympic record)
Broad Jump—Vera Krepkina, Soviet Union, 20 feet, 10⅞ inches (olympic record)

WATER POLO

Team—Italy

WEIGHT LIFTING

Bantamweight—Charles Vinci, United States, 760½ pounds (equals world record)
Featherweight—Yevgeni Minaev, Soviet Union, 821 pounds (equals world record)
Lightweight—Viktor Bushuev, Soviet Union, 876 pounds (world record)
Middleweight—Alexander Kurynov, Soviet Union, 964½ pounds (world record)
Light Heavyweight—Ireneusz Palinski, Poland
Middle Heavyweight—Arkadi Vorbiev, Soviet Union, 1,039½ pounds (world record)
Heavyweight—Yuri Vlasov, Soviet Union, 1,182½ pounds (world record)

WRESTLING, FREE-STYLE

Flyweight—Ahmet Bilek, Turkey
Bantamweight—Terry McCann, United States
Featherweight—Mustafa Dagistanli, Turkey
Lightweight—Shelby Wilson, United States
Welterweight—Doug Blubaugh, United States
Middleweight—Hasan Gungor, Turkey
Light Heavyweight—Ismet Atli, Turkey
Heavyweight—Wilfried Dietrich, Germany

WRESTLING, GRECO-ROMAN

Flyweight—Dumitru Pirvulescu, Rumania

Bantamweight—Oleg Karavaev, SOVIET UNION
Featherweight—Muzahir Sille, TURKEY
Lightweight—Aitandil Koridze, SOVIET UNION
Welterweight—Mithat Bayrak, TURKEY
Middleweight—Dimitrio Dobrev, BULGARIA
Light Heavyweight—Tevfik Kis, TURKEY
Heavyweight—Ivan Bogdan, SOVIET UNION

YACHTING

5.5-Meter—George O'Day, UNITED STATES
Dragon—Crown Prince Constantine, GREECE
Star—Timir Pinegin, SOVIET UNION
Flying Dutchman—Peder Lunde, Jr., NORWAY
Finn Monotype—Paul Elstrom, DENMARK

MEDAL WINNERS

	GOLD	SILVER	BRONZE
SOVIET UNION	43	29	31
UNITED STATES	34	21	16
ITALY	13	10	13
GERMANY	12	19	11
AUSTRALIA	8	8	6
TURKEY	7	2	0
HUNGARY	6	8	7
JAPAN	4	7	7
POLAND	4	6	11
CZECHOSLOVAKIA	3	2	3
RUMANIA	3	1	6
UNITED KINGDOM	2	6	12
DENMARK	2	3	1
NEW ZEALAND	2	0	1
BULGARIA	1	3	3
SWEDEN	1	2	3
FINLAND	1	1	3
AUSTRIA	1	1	0
YUGOSLAVIA	1	1	0
Pakistan	1	0	1
GREECE	1	0	0
ETHIOPIA	1	0	0
NORWAY	1	0	0
SWITZERLAND	0	3	3
FRANCE	0	2	3
BELGIUM	0	2	2
IRAN	0	1	3
NETHERLANDS	0	1	2
SOUTH AFRICA	0	1	2
ARGENTINA	0	1	1
UNITED ARAB REPUBLIC	0	1	1
CANADA	0	1	0
TAIWAN	0	1	0
GHANA	0	1	0
INDIA	0	1	0
PORTUGAL	0	1	0
SINGAPORE	0	1	0
MOROCCO	0	1	0
BRAZIL	0	0	2
WEST INDIES	0	0	2
IRAQ	0	0	1
MEXICO	0	0	1
SPAIN	0	0	1
VENEZUELA	0	0	1

UNOFFICIAL POINT SCORES

	1960	1956
SOVIET UNION	807½	722
UNITED STATES	564½	593
GERMANY	319¼	223 [1]
ITALY	270	185
HUNGARY	168½	220½
AUSTRALIA	168½	278½
POLAND	158¾	73½
JAPAN	156	139
UNITED KINGDOM	116¼	180½
RUMANIA	85½	108
TURKEY	85	61
CZECHOSLOVAKIA	81½	71½
SWEDEN	64½	164
FRANCE	52¾	120½
DENMARK	51	29
FINLAND	50½	98½
BULGARIA	42	31½
NETHERLANDS	39¾	0
SWITZERLAND	38¾	5
NEW ZEALAND	38	26
BELGIUM	26	11
YUGOSLAVIA	24½	22
IRAN	22	18
SOUTH AFRICA	21½	24
NORWAY	20	21
CANADA	16	52
UNITED ARAB REPUBLIC	15½	0
AUSTRIA	15	12
PAKISTAN	15	5
ARGENTINA	11½	18½
BRAZIL	11	12
WEST INDIES FEDERATION	10	7 [2]
ETHIOPIA	10	0
MEXICO	10	17
GREECE	10	4
INDIA	9	10
SOUTH KOREA	6	22
VENEZUELA	6	0
TAIWAN	5	0
MOROCCO	5	0
SINGAPORE	5	0
PORTUGAL	5	3
GHANA	5	0
SPAIN	4	1
IRAQ	4	0
IRELAND	4	28½
CUBA	3	1
PUERTO RICO	3	0
RHODESIA	3	0
ICELAND	2	5
BAHAMAS	1	4
KENYA	1	0
LUXEMBOURG	¾	0
CHILE	0	17
URUGUAY	0	6
NIGERIA	0	2
MALAYA	0	1

NOTE: Based upon 10 points for each first place, 5 for second, 4 for third, 3 for fourth, 2 for fifth and 1 for sixth.

[1] East and West Germany competed as one team in both 1956 and 1960.

[2] 1956 score is for Trinidad only.

SPORTS SUMMARY OF 1960

AUTOMOBILE RACING

Indianapolis "500"—Jim Rathmann

12-hour Endurance Race at Sebring, Florida—Olivier Gendebien, BELGIUM, and Hans Hermann, GERMANY

BASEBALL

Final Major League Standings

American League	WON	LOST	PER CENT	GAMES BEHIND
New York	97	57	.630	. . .
Baltimore	89	65	.578	8
Chicago	87	67	.565	10
Cleveland	76	78	.494	21
Washington	73	81	.474	24
Detroit	71	83	.461	26
Boston	65	89	.422	32
Kansas City	58	96	.377	39
National League				
Pittsburgh	95	59	.617	. . .
Milwaukee	88	66	.571	7
St. Louis	86	68	.558	9
Los Angeles	82	72	.532	13
San Francisco	79	75	.513	16
Cincinnati	67	87	.435	28
Chicago	60	94	.390	35
Philadelphia	59	95	.383	36

Major League Leaders (400 or more AB's)

	American League		*National League*	
BATTING PCT.	Runnels, BOST.	.320	Groat, PITTS.	.325
	Smith, CHI.	.315	Larker, L. A.	.323
	Minoso, CHI.	.311	Mays, S. F.	.319
	Skowron, N. Y.	.309	Clemente, PITTS.	.314
	Kuenn, CLEV.	.308	Boyer, ST. L.	.304
RUNS BATTED IN	Maris, N. Y.	112	Aaron, MILW.	126
	Minoso, CHI.	105	Mathews, MILW.	124
	Wertz, BOST.	103	Banks, CHI.	117
	Lemon, WASH.	100	Mays, S. F.	103
	Gentile, BALT.	98	Boyer, ST. L.	97
HOME RUNS	Mantle, N. Y.	40	Banks, CHI.	41
	Maris, N. Y.	39	Aaron, MILW.	40
	Lemon, WASH.	38	Mathews, MILW.	39
	Colavito, DET.	35	Boyer, ST. L.	32
	Killebrew, WASH.	31	Robinson, CINC.	31

World Series—Pittsburgh Pirates defeated New York Yankees, 4 games to 3

All-Star Game No. 1—National 5, American 3

All-Star Game No. 2—National 6, American 0

International League—Toronto

American Association—Louisville

Little World Series—Louisville

Little League World Championship—Levittown, Pennsylvania

BASKETBALL

College Conferences:

- *Ivy League*—Princeton
- *Atlantic Coast*—Duke
- *Southeastern*—Auburn
- *Southern*—West Virginia
- *Western Big Ten*—Ohio State
- *Big Eight*—Kansas and Kansas State (tie)
- *Southwest*—Texas
- *Rocky Mountain*—Idaho State
- *Mid-American*—Ohio University
- *Mid-Atlantic*—St. Joseph's
- *West Coast*—Santa Clara
- *Ohio Valley*—Western Kentucky
- *Yankee*—Connecticut
- *Skyline*—Utah
- *Border*—New Mexico State

U. S. Collegiate Championship (NCAA)—Ohio State

National Invitation Tournament—Bradley

AAU Men's Championship—Peoria Caterpillars

AAU Women's Championship—Nashville Business College

National Basketball Association (Pro):

- *Eastern Division*—Boston
- *Western Division*—St. Louis
- *Championship Series*—Boston
- *All-Star Game*—East

BOWLING

American Bowling Congress:

- *Singles*—Paul Kulbaga
- *Doubles*—Dick Jensen and Andy Marzich
- *Master's*—Billy Golembiewski
- *All-Events*—Vince Lucci
- *Team*—A. and A. Asphalt

BOXING

World Champions:

- *Heavyweight*—Floyd Patterson, UNITED STATES
- *NBA Middleweight*—Gene Fullmer, UNITED STATES
- *Welterweight*—Benny Paret, CUBA
- *Lightweight*—Joe Brown, UNITED STATES
- *Featherweight*—Davey Moore, UNITED STATES
- *Flyweight*—Pone Kingpetch, THAILAND

AAU Championship—Ohio Association

DOG SHOWS (Best of Show)

Westminster Kennel Club—Ch. Chik T'Sun

International Kennel Club—Ch. Blanart Bewitching

FIGURE SKATING

World Championships:
  Men—Alain Giletti, FRANCE
  Women—Carol Heiss, UNITED STATES
  Pairs—Barbara Wagner and Robert Paul, CANADA

FOOTBALL

College Conferences:
  Ivy League—Yale
  Big Ten—Minnesota and Iowa (tie)
  Southeastern—Mississippi
  Big Eight—Missouri
  Rocky Mountain—Adams State
Rose Bowl—Washington
Orange Bowl—Missouri
Sugar Bowl—Mississippi
Cotton Bowl—Duke
Professional:
  National League—Philadelphia
  American League—Houston
  Canada, Grey Cup—Ottawa

GOLF

U. S. Men's Open—Arnold Palmer
U. S. Women's Open—Betsy Rawls
Men's P.G.A.—Jay Hebert
Women's P.G.A.—Mickey Wright
Master's—Arnold Palmer
U. S. Men's Amateur—Deane Beman
U. S. Women's Amateur—Jo Anne Gunderson
Canadian Men's Open—Art Wall, Jr., UNITED STATES
Canadian Women's Open—Judy Darling, CANADA
British Open—Kel Nagle, AUSTRALIA
British Men's Amateur—Joe Carr, IRELAND
British Women's Amateur—Barbara McIntire, UNITED STATES
Curtis Cup—UNITED STATES
Americas Cup—UNITED STATES
Canada Cup—UNITED STATES
World Amateur Championship—UNITED STATES
U. S. Collegiate Championship—Richard Crawford

HORSE RACING

Kentucky Derby—Isaac Blumberg's Venetian Way
Preakness—Leonard Fruchtman's Bally Ache
Belmont Stakes—Joseph E. O'Connell's Celtic Ash
Arlington Classic—C. R. McCoy's T. V. Lark
Epsom Derby (BRITAIN)—Sir Victor Sassoon's St. Paddy
Dominion Day Handicap (CANADA)—M. J. Boylen's Anita's Son

ICE HOCKEY

National Hockey League—Montreal Canadiens
Stanley Cup—Montreal Canadiens
U. S. Collegiate Championship—Denver

ROWING

Intercollegiate Rowing Assn. Regatta—California
Royal Canadian Henley Regatta—Detroit Boat Club
Thames Challenge Cup, Royal Henley Regatta—Harvard

SWIMMING

AAU Championships:
  Men's Indoor—Southern California
  Men's Outdoor—Indianapolis Athletic Club
  Women's Indoor—Santa Clara Swim Club
  Women's Outdoor—Santa Clara Swim Club
U. S. Collegiate Championship—Southern California

TENNIS

Davis Cup—AUSTRALIA
U. S. Men's Singles—Neale Fraser, AUSTRALIA
U. S. Women's Singles—Darlene Hard, UNITED STATES
U. S. Men's Doubles—Roy Emerson and Neale Fraser, AUSTRALIA
U. S. Women's Doubles—Maria Bueno, BRAZIL, and Darlene Hard, UNITED STATES
U. S. Mixed Doubles—Margaret Osborne du Pont, UNITED STATES, and Neale Fraser, AUSTRALIA
Wightman Cup (Women's)—GREAT BRITAIN

Wimbledon:
  Men's Singles—Neale Fraser, AUSTRALIA
  Women's Singles—Maria Bueno, BRAZIL
  Men's Doubles—R. Dennis Ralston, UNITED STATES, and Rafael Osuna, MEXICO
  Women's Doubles—Darlene Hard, UNITED STATES, and Maria Bueno, BRAZIL
  Mixed Doubles—Darlene Hard, UNITED STATES, and Rodney Laver, AUSTRALIA

TRACK AND FIELD

AAU Men's Indoor—New York Athletic Club
AAU Men's Outdoor—Southern California Striders
AAU Women's Indoor—Tennessee State
AAU Women's Outdoor—Tennessee State
AAU Decathlon—Rafer Johnson
U. S. Collegiate Championship—Kansas

WRESTLING

AAU Individual Championship—Bill Kerslake
AAU Team Championship—New York Athletic Club
U. S. Collegiate Championship—Oklahoma

OTHER SPORTS CHAMPIONS

World Bobsled Championship:
  Four-man—ITALY
  Two-man—ITALY
U. S. Chess Championship—Bobby Fischer
World Chess Championship—Mikhail Tal, SOVIET UNION
U. S. Collegiate Fencing—New York University
AAU Gymnastics—Penn State
U. S. Collegiate Gymnastics—Penn State
AAU Individual Judo—Haruo Imamura
AAU Team Judo—Southern California Association
U. S. Collegiate Skiing—Colorado
U. S. Open Squash Racquets—Roshan Khan, PAKISTAN
American Challenge Cup (*Soccer*)—Bangu, BRAZIL
Newport-to-Bermuda Yacht Race—Carleton Mitchell's *Finisterre*

American Bar Foundation awards	Dean **Erwin N. Griswold** and **John Lord O'Brian**
Catholic Association for International Peace award	**George L. Warren**, for refugee and immigration work
Distinguished Civilian Service Award of the United States Navy	Dr. **Peter King**, for fallout studies
Distinguished Public Service Award of the United States Navy	Dr. **Jacques Piccard**, SWITZERLAND, for deep-sea exploration
Florina Lasker Civil Liberties Award ($1,000)	**Herbert L. Block** (**Herblock**)
Freedom Award of Freedom House	**Alan Paton**, SOUTH AFRICA
German Peace Prize	**Victor Gollancz**, GREAT BRITAIN
George Washington Award of the Freedoms Foundation ($5,000)	Senator **John L. McClellan**
Human Rights Award of the Joint Defense Appeal of the American Jewish Committee and the Anti-Defamation League of B'nai B'rith	**John J. McCloy**
Jane Addams Medal	**Alice K. Leopold**
Legion of Merit of the United States Navy	Lieutenant **Don Walsh**, for deep-sea exploration
Lenin Peace Prizes	**Laurant Casanova**, FRANCE; **Cyrus S. Eaton**; **Aziz Sharif**, IRAQ; and President **Sukarno**, INDONESIA
Nobel Peace Prize	NOT AWARDED
Sidney Hillman Foundation awards ($500)	**Charles H. Drake**, **Harry W. Ernst**, **Harold M. Hyman**, **Ely A. Landau** and **Edward P. Morgan**

NOTE: Unless otherwise noted, prize winners are from the United States.

QUIZ:

WHAT'S YOUR READING SCORE?

All questions are based on articles in this book. You may enjoy seeing how many you can answer without referring to the articles.

PAGE

1. What kinds of experts will be especially important in the 1960's? 25
2. What Canadian financial problems are most disturbing to the Bank of Canada? 26
3. What was the U-2 incident? 28
4. What is the cause of one vital rift between Russia and Red China? 31
5. Name two parts of the world where it is expected that the Communists will make trouble for the Western world. 34
6. Name some of the main developments in Canadian politics during 1960. 35
7. Name at least three reactions of prominent people to man's vast attempt to conquer outer space. 40
8. What do experts say about the causes and cures for slumps in baseball? 45
9. Explain the January crisis that troubled the French Fifth Republic. 50
10. What country exploded a nuclear device in the Sahara in February? 53
11. What is meant by the term "apartheid" and how does it work? 56
12. In what countries was there severe student rioting in April? 58
13. Whose important visit to Japan was canceled in June, and why? 63
14. Name eight world leaders who met at the UN in the fall of 1960. 80
15. Name at least eight prominent people who died during 1960. 84
16. What new technique was used in 1960 by the Negroes to achieve integration? 88
17. Can you name some factors responsible for John F. Kennedy's presidential victory? 92
18. Exactly what are farm subsidies? 94
19. In what ways are Beats different from other people? 97
20. What is the Electoral College? 100
21. Why is it so frequently criticized? 100
22. What are the main sources of vast economic growth in the United States? 102
23. What problems have arisen concerning national sovereignty over coastal waters? 106
24. In what ways has Australia developed economically during the last few years? 108

25. What is the least densely populated nation on earth? 109
26. How will the world benefit from the development of the French Sahara? 111
27. What was one of the most noticeable trends of 1960 in Latin America? 115
28. Name four liberal and progressive Latin American presidents who were inaugurated in the year 1960. 117
29. What is the name of Brazil's new capital city? 117
30. Name some of the measures that the South African Government has taken in its apartheid program in 1960. 122
31. How has education in the Soviet Union improved since 1917? 123
32. What are the various levels in the hierarchy of the Soviet Union? 128
33. What is the "new diplomacy"? 131
34. What is meant by the "third force" in the United Nations? 134
35. Describe some of the new communist tactics in southeast Asia. 137
36. Why are Western experts concerned over the enormous economic advances recently achieved by the Soviet Union? 141
37. What services do air taxis perform? ...160
38. Name the various activities included under the title of "general aviation." 162
39. What are the airlines doing to speed passenger processing at airports? 164
40. Name some of the recently developed airplanes that were flying in 1960. 167
41. What is the state of consumer debt in the United States? Who borrows most? Why? And from whom do they borrow? 169
42. Name eight of the most important convention cities in the United States and several in Canada. 173
43. Name five products that Japan produces mainly for export. 176
44. How do executive-recruiting firms operate and what purposes do they serve? 180
45. Can you name some new techniques that are used in mining and blasting? 182
46. What is miniaturization? 185
47. In what way is Canada now boosting her gas exports? 188
48. How much space should you leave between the car you are driving and the car that is just ahead of you? 191
49. How have motels changed since 1913? ..194
50. What are some of the necessary techniques for making a good lawn? 214
51. What particularly interesting investigation is now under way at the National Radio Astronomy Observatory that is located near Green Bank, West Virginia? 217
52. What was learned about the earth's atmosphere during the IGY? 220
53. In what ways did scientists effect a virus breakthrough in 1960? 223
54. What are considered to be the main causes of water pollution? 226
55. What are tsunamis? 229
56. What is Gompertz' law? 232
57. What is your desirable weight? 235
58. What special purposes did the Tiros satellites serve? 237
59. In what ways is low-temperature science bringing about new developments? 246
60. What is the promise of thermoplastic tape for the future? 249
61. How does the Wankel rotating combustion engine work? 252
62. Name five space vehicles that were launched successfully in 1960. 257
63. To what does the frequently used term "missile gap" refer? 263
64. Who is Dr. Lise Meitner? 268
65. Mention five of the outstanding art exhibitions of last year. 290
66. What was perhaps the dominant aspect of dance in 1960? 298
67. What is the Library Services Act? 302
68. What types of exhibits can the visitor see at Mystic Seaport? 304
69. Name ten books that were acclaimed by the critics in 1960. 307
70. Name five books about the Civil War that were published in 1960. 311
71. What was the international aspect of music during 1960? 314
72. Who is Birgit Nilsson? 322
73. What are the most often stated criticisms of American education? 328
74. Explain what team teaching is. 332
75. How do teaching machines work? 335
76. What is MPATI? 338
77. Name some of the most important changes that have occurred in the teaching of basic science in the last decade. 341
78. What were ten outstanding motion pictures of the last year? 354
79. Who is Ingmar Bergman? 359
80. What is pay TV and how is it expected to operate? 369
81. What are the various factors involved in producing a play? 378
82. In what way can a beginner most easily start to make ship models? 386
83. How would a gardener go about creating a wild-flower garden? 388
84. There are many new trends in fishing tackle; name three. 391
85. How many Americans bowl? 399

ALMANAC for 1961

Important Holidays, Events and Anniversaries of the Year*

JANUARY

1	SUN.	New Year's Day
6	FRI.	Epiphany
19	THU.	(General Robert E.) Lee's Birthday (*southern U. S.*)
20	FRI.	Inauguration Day (*U. S.*)
29	SUN.	Kansas admitted to the Union, 1861

FEBRUARY

2	THU.	Ground-Hog Day
3	FRI.	Horace Greeley, born 1811
12	SUN.	Lincoln's Birthday (*U. S.*)
14	TUE.	St. Valentine's Day Mardi Gras (Shrove Tuesday)
15	WED.	Ash Wednesday Alfred North Whitehead, born 1861
22	WED.	Washington's Birthday (*U. S.*)

MARCH

2	THU.	Purim
17	FRI.	St. Patrick's Day
20	MON.	Spring begins at 3:32 P.M. EST
26	SUN.	Palm Sunday
31	FRI.	Good Friday

APRIL

1	SAT.	Passover, first day All Fools' Day
2	SUN.	Easter
11	TUE.	General MacArthur relieved of Far East commands, 1951
12	WED.	Start of American Civil War, 1861
14	FRI.	Pan-American Day
15	SAT.	Bliss Carman, born 1861
18	TUE.	European Coal and Steel Community treaty signed, 1951
26	WED.	David Hume, born 1711

MAY

1	MON.	May Day
11	THU.	Ascension Day
14	SUN.	Mother's Day
20	SAT.	Armed Forces Day (*U. S.*)
21	SUN.	Whitsunday (Pentecost)
22	MON.	National Maritime Day (*U. S.*) Victoria Day and Official Birthday of Queen Elizabeth II (*Canada*)
28	SUN.	Trinity Sunday
30	TUE.	Memorial Day (*U. S.*)

JUNE

1	THU.	Corpus Christi
3	SAT.	Jefferson Davis' Birthday (*southern U. S.*)
14	WED.	Flag Day (*U. S.*) Harriet Beecher Stowe, born 1811
18	SUN.	Father's Day (*U. S.*)
21	WED.	Summer begins at 10:30 A.M. EST

JULY

1	SAT.	Dominion Day (*Canada*)
4	TUE.	Independence Day (*U. S.*)
18	TUE.	William Makepeace Thackeray, born 1811

AUGUST

15	TUE.	Feast of the Assumption
31	THU.	Théophile Gautier, born 1811

SEPTEMBER

4	MON.	Labor Day Transcontinental television began in the U. S., 1951
8	FRI.	Japanese Peace Treaty signed, 1951
11	MON.	Rosh Hashana (*Jewish New Year*), first day
17	SUN.	Citizenship Day (*U. S.*)
20	WED.	Yom Kippur (Day of Atonement)
22	FRI.	American Indian Day (*U. S.*)
23	SAT.	Autumn begins at 1:43 A.M. EST

OCTOBER

4	WED.	Frederic Remington, born 1861
9	MON.	Thanksgiving Day (*Canada*)
10	TUE.	Fridtjof Nansen, born 1861
11	WED.	General Pulaski Memorial Day
12	THU.	Columbus Day Paraguay declared independence from Spain, 1811
22	SUN.	Franz von Liszt, born 1811
24	TUE.	United Nations Day (*U. S.*)
31	TUE.	Halloween

NOVEMBER

1	WED.	All Saints' Day
7	TUE.	Election Day (*U. S.*) William Henry Harrison won Battle of Tippecanoe, 1811
11	SAT.	Veterans Day (*U. S.*) Remembrance Day (*Canada*)
23	THU.	Thanksgiving Day (*U. S.*)

DECEMBER

3	SUN.	Hanukkah, first day First Sunday in Advent
4	MON.	Lillian Russell, born 1861
16	SAT.	Amundsen reached South Pole, 1911
18	MON.	Edward MacDowell, born 1861
21	THU.	Winter begins at 9:20 P.M. EST
25	MON.	Christmas

1962

JANUARY

1	MON.	New Year's Day
6	SAT.	Epiphany
19	FRI.	(General Robert E.) Lee's Birthday (*southern U. S.*)

FEBRUARY

2	FRI.	Ground-Hog Day
12	MON.	Lincoln's Birthday (*U. S.*)
14	WED.	St. Valentine's Day Arizona admitted to the Union, 1912
22	THU.	Washington's Birthday (*U. S.*)

MARCH

6	TUE.	Mardi Gras (Shrove Tuesday)
7	WED.	Ash Wednesday
17	SAT.	St. Patrick's Day
20	TUE.	Purim

---

* *The anniversaries listed in the* Almanac *are of events that occurred 10 years ago, 100 years ago, 150 years ago and so forth.*

INDEX

A

- Absolute zero, 246
- Accelerator, synchrotron, 273, illus., 274
- Accidents, traffic, 191–93, 205
- Actors Equity strike, with illus., 377, illus., 378
- Adams, John, 100–01
- Adenauer, Konrad, 34, illus., 32
- Advertising, 202–03, 371
- Aerial reconnaissance
  - planes, 166
  - RB-47 incident, 67
  - thermoplastic recordings, 251
  - U-2 incident, 28–30
- Aeronautics, see Aviation
- Afghanistan, 57
- Africa, 21–22
  - communism, 32
  - new nations, with map, 146–47
  - new UN members, with illus., 134–36
  - oil in Sahara, with illus., 111–14
  - student exchange, 351
  - *See also* names of countries
- Aging, in study of longevity, with illus., 232–36
  - employment statistics, 198–99
- Agriculture
  - farm collectivization, 127–30
  - farm subsidies, with illus., 94–96
  - turf-grass, with illus., 214–16
- Air, see Atmosphere
- Air alerts, 265, 267
- Air Force, U. S., 167–68
- Air taxis, with illus., 160–61
- Aircraft, see Aviation
- Airplanes, see Aviation
- Airports, motels in, 194, 196, illus., 197
- Airwayte, motel, 196
- Albania, communism, 130
- Alessandri, Jorge, illus., 115
- Alfred Newton Richard Medical Research Building, illus., 347
- Algeria, events, 20, with illus., 50–65, 111–14
- Allen, James E., Jr., 331
- American Ballet Theatre, 298–99, illus., 300–01
- American Bowling Congress, 399–400
- American Football League, 398
- American Library Association, 302
- American Medical Association, with illus., 175
- American Motor Hotel Association, 196
- Ammonium nitrate, explosive, 182–83
- Amplifiers, miniature, illus., 187
- Andrews, Julie, 375, illus., 373
- Animals
  - rats, used in research, 232–33, 234
  - recovery from earth orbit, 257, 261
  - *See also* Birds
- Anniversaries, 420
- Anthropology, highlights, 270, illus., 271
- Antibodies, 223–24
- Antimatter, 280
- Antiparticles, 280
- Apartheid, 54, with illus., 56, 59, 120–22
- Apollo, Project, 261
- Archaeology, highlights, 270, illus., 271
- Architecture
  - Chamber of Deputies, Brasilia, illus., 119
  - school campuses, with illus., 344–47
- Arena Stage, 376, illus., 373
- Argentina, 54–55, 57–58, 65, 68, 74, 118–19
- Arizona, libraries, 303
- Armstrong-Jones, Antony, 19, 55, 62, illus., 54
- Art
  - communist countries, 128, 129–30
  - Danish, modern design, with illus., 294–97
  - review, with illus., 290–93, 325
  - *See also* names of arts, as Music
- Asanuma, Inejiro, 74, illus., 73
- Ashton, Frederick, 299, 300–01
- Asia
  - communism, with illus., 137–40
  - Khrushchev visit, 53
  - map, 147
  - United Nations, influence in, 134–36
  - *See also* names of countries
- Astronauts, 261–62
- Astronomy, 217–19, 278, 371–72
- Aswan High Dam, 52
- Athletics, see Sports
- Atlases, missiles, 260, 262
- Atmosphere, study of, 220–22, with illus., 237–41
- Atomic energy
  - explosives, 184
  - icebreaker, Soviet, illus., 144
  - Meitner, Lise, with illus., 268–69
  - power plant, diagram, 281
  - submarines, 262, 266–67, illus., 258
  - *See also* Nuclear devices
- Auctions, 293
- Audiences, 372, 380
- Audio-visual aids, in teaching science, 343
- Australia, blockade-runner, 304, illus., 305
- Australia, business expansion, with illus., 108–10
- Austria, 66, 74–75
- Automation, 19, illus., 18
  - teaching machines, with illus., 335–37
- Automobiles
  - desert trucks, 112, illus., 113
  - Russia and United States, 143
  - traffic safety, 191–93, statistics 205
  - Wankel rotating combustion engines, 254–56

Aviation
  air taxis, with illus., 160–61
  airline services, with illus., 164–65
  B-52, jet bomber, 264–65, 267, illus., 266
  developments, 17, 270, with illus., 166–68
  MPATI, with illus., 338–40
  private flying, with illus., 162–63
  Russia and United States, 142–45
  statistics, 204
  U-2 incident, 28–30
Awards, *see* Prizes and awards

B

B-52, jet bomber, 264–65, 267, illus., 266
Baggage handling, with illus., 164–65
Balance of power, 32–33
Balewa, Sir Abubakar Tafawa, illus., 81
Ballet, *see* Dance
Ballistic Missile Early Warning System (BMEWS), 264, illus., 263
Balloons, weather, 220
Bandaranaike, Mrs. Sirimavo, 68, illus., 67
Banks and banking, *see* Finance
Baringer, William E., 311
Baseball, illus., 405
  slumps, cause of, with illus., 45–47
Basketball, illus., 406
Basler, Roy P., 311
Bearings, frictionless, 248
Beats, with illus., 97–99
Begtsson, Gerda, illus., 297
Belgium, events, 19, 23, 53, 66
Bell, Bert, 397, 398
Bell, David E., 77
Bellamy, Ralph, 358, illus., 356
Beltran, Pedro, 119
Ben Hur, movie, 354
Bennet, William A. C., illus., 37
Benson, Ezra T., 96
Berg, Benjamin N., 232, 234
Bergman, Ingmar, with illus., 359–61
Bergman, Ingrid, with illus., 364
Berlin, 30, 34, 71, 72
Bernstein, Leonard, illus., 318
Bestor, Arthur, 329
Betancourt, Romulo, with illus., 119
Bevan, Aneurin, illus., 85
Bibliography, Civil War books, 313
Biochemistry, illus., 24
Biography of a Cancer, TV, with illus., 365
Biological sciences, with illus., 272, 342
Birds, chickadee in flight, illus., 242–45
Black Swan pas de deux, ballet, 299, illus., 301
Blasting, 182–84
Bloomgarden, Kermit, 377–78
Bohr, Niels, 269
Bojesen, Kay, illus., 296
Boland, Frederick H., 71
Bolivia, 64
Bookmobiles, 302–03
Books
  censorship, 328
  Civil War, with list, 311–13
  prizes and awards, 325
  review, with lists, 307–10
  rural libraries, 302–03
Boston Symphony Orchestra, 314
Bowles, Chester, 77
Bowling, with illus., 399–401, illus., 408
Boxing, illus., 406
Brasilia, Brazil, with illus., 117–19
Brazil, 58, 73, 115, with illus., 117–19
Brooklyn, Long Island University, illus., 347
Brosnan, Jim, with illus., 45–46
Brown, George, 33
Bruhn, Erik, 298, 299, illus., 301
Brundage, Avery, illus., 407
Budget, U. S., statistics, 148–49
Building, United States, future in, 104–05
Bulgaria, communism and economics, 130
Bunnage, Avis, illus., 375
Burke, Lynn, illus., 409
Burma, 54, 137–38, 140
Burr, Aaron, 100–01
Business
  advertising, statistics, 202–03
  aircraft used, 160–61, 168
  Australian expansion, 108–10
  conventions, with illus., 173–75
  executive recruiters, 179–81
  United States, future in, with charts, 102–05
  See also Finance
Bye, Bye, Birdie, cast of play, illus., 320

C

Cabinet, U. S., 77–78
California, University of, illus., 347
Callas, Maria, 321, illus., 319
Camelot, musical play, 375, illus., 373
Cameroon, 52, 146
Camus, Albert, illus., 84
Canada
  art review, 291
  conventions, with illus., 173–75
  events, 52, 63, 65, 73, with illus., 60, 67
  natural gas, with map, 188–90
  politics, with illus. and map, 35–37
  private flying, 163
  sovereignty over coastal waters, 106–07
  statistics, 154–55
  trade, with illus., 26–27, statistics, 201
  University of Montreal, illus., 346
Canadair CL-44, with illus., 167
Cancer research, 223–25
Cantinflas, illus., 357
Caravelle, plane, 167, illus., 166
Carter, Don, illus., 408
Cartoons, End of the Year, 38–39
Cass, Peggy, illus., 374
Castro, Fidel, illus., 80
Catton, Bruce, 312
Cavalleri, Rina, illus., 319
Census, Soviet Union, statistics, 153
  United States, 150–52
Central African Republic, 70, 147
Central America, *see* Latin America
Ceylon, 58, 68, illus., 67
Chad, 70, 147
Charles W. Morgan, whaleship, 304, 306
Charts, *see* Statistics
Chemistry, 272–73
  education in, 342, illus., 341, 343

- Chemistry (cont.)
  - explosives, with illus., 182–84
  - *See also* Biochemistry
- Chiari, Roberto F., 117
- Chicago, Illinois, conventions, 174
- Chickadee, in flight, illus., 242–45
- Children
  - education in Soviet Union, with illus., 123–26
  - libraries for, with illus., 302–03
- Chile, 57, 63, 118, 229, illus., 115
- China
  - communism, 128, 137, 140, with illus., 129
  - events, 22, 55, 58
  - production statistics, 209
  - Soviet Union, relations with, with illus., 31–32, illus., 33
  - United Nations, 135–36
- Churchill, Gordon, 27
- Churchill, Winston, 132, illus., 133
- Churk, with illus., 272
- Cities, conventions, with illus., 173–75
  - population, United States, 150
- Civil rights, 52, 58, with illus., 57, 60, 88–90
- Civil War, books about, with list, 310–13
- Cleveland, Grover, 101
- Clouds, study of, 238, illus., 240
- Code, interstellar broadcast, 219
- Coexistence, Russia and the West, 31–34
- Cold war, 20–22, 31–34, 134–36
- Colleges and universities, see Education
- Collins, S. C., 246
- Colombia, 72
- Colonialism, United Nations, 136
- Coloreds, in South Africa, 120, 121
- Colter, J. S., 224
- Combustion engines, with illus., 252–56
- Commercial aviation, 166–67
- Commonwealth of Nations
  - apartheid, views on, 122
- Communication, interstellar, 278, with illus., 217–19
  - semantics, 25
- Communication reflector, Echo I, 258–59, illus., 261
- Communism
  - communist states, with illus., 127–30
  - Russia and China, with illus., 31–32, illus., 33
  - Southeast Asia, with illus., 137–40
- Competition
  - bowling, 400, 401
  - judo, 403
  - music, 315
- Computers, 19, 164, 251, with illus., 248, illus., 18
- Conant, James Bryant, 331, illus., 330
- Conductors, symphony, with illus., 314–17
- Conferences, international, with illus., 31–34
- Congo, Republic of the, 34, 53, 66, 77, 146, with illus., 68–73, illus., 83
- Congo Republic, 147
- Congress, U. S., 89–90, 92, 101, 263–66, 302–03
- Connally, John B., Jr., 78
- Conrad, Max, 162
- Conservation, 95, 226–28, 388
- Conservative Party, Canada, 35, 37
- Construction, United States, future in, 104–05
- Consumer credit, with illus., 169–72
- Conventions, 194, 362, 365, with illus., 173–75
- Coombs, Philip H., 331
- Corso, Gregory, with illus., 99
- Cosmic rays, 280
- Cosmic rockets, 220–21
- Costa Rica, OAS meeting, 68, 116
- Cousy, Bob, illus., 406
- Cox, Archibald, 78
- Coyne, James, 26
- Crowder, Norman, 336, 337
- Cuba, 32–33, 52–76, 115–17, illus., 64, 76
- Curriculum, in schools, 328–31
- Cyprus, 52, 70, 147
- Cyrogenics, 246–48
- Czechoslovakia, 130, illus., 127

D

- Dahomey, 69, 147
- Dairy products, price support, 95
- Dallas, Texas, Memorial Auditorium, 174
- Dance, with illus., 298–301
- Dandelion, weed, 216, illus., 215
- Data processing, 241, 251
- Davis, Donald, illus., 363
- Davis, Jefferson, books about, 312
- Day, J. Edward, 77
- Deaths, statistics, 205
  - traffic accidents, 191–93
  - *See also* Obituaries
- Debates, Kennedy-Nixon, 362–63, illus., 366–67
- Debt, see Finance
- Defense, United States, 260, with illus., 263–67
- De Gaulle, Charles, 34, 50–65, illus., 32, 60, 83
- De la Tour, Georges, 290, illus., 291
- Democratic Party, 91–93
- Denmark
  - design, modern, with illus., 294–97
  - King and Queen in Washington, illus., 82
  - student exchange, 351
- Design
  - campus layouts, with illus., 344–45
  - Danish, with illus., 294–97
  - motels, with illus., 196–97
  - Wankel rotating combustion engine, with illus., 252–56
- Dewey, John, 331, illus., 329
- Diary, events of year, with illus., 50–79
- Diefenbaker, John, illus., 80
- Dillon, C. Douglas, 77, 141
- Diplomacy, world, with illus., 131–33
- Disarmament
  - Canadian politics, 37
  - Geneva conferences, 54–55, 59–62
  - space research, 42–43
  - UN influence, 134–36
- Discoverers, satellites, 279, with illus., 257–58
- Disease
  - grass, 216
  - research, 232–34
  - virus infections, control, with illus., 223–25
  - weight factor in, 236
- Ditzel, Nanna and Jorgen, illus., 296
- Doerfer, John C., 363
- Dominican Republic, 68, 116
- Dooley, Thomas, with illus., 365
- Douglas, Thomas C., 35, illus., 37
- Douglas DC-8, with illus., 167

Drake, Frank D., 218
Drama, see Theater
Dreadnought principle, 142–43
Driving, automobile, with illus., 191–93
Dulles, Allen W., 264, 267
Dulles, John Foster, 131, 132–33
Durfee, James R., 142
Durrell, Lawrence, 307
Dutchman's-breeches, with illus., 389–90
Dykstra Hall, University of California, illus., 347
Dymling, Carl Anders, 359
Dynamite, explosive, 182, illus., 183

E

Earth, atmosphere of, 220–22
Earthquakes, 118, 229–31
East Germany, see Germany
Echo I, satellite, 258–59, 279, illus., 261
Economics
  Australia, with illus., 108–10
  communist countries, 127–30
  consumer credit, with illus., 169–72
  France-Algeria, 114
  Japan, 176–78
  Latin America, 115–19, 210–11
  Soviet Union, with illus., 141–45
  statistics, 148–49, 200–01
  theater, with illus., 377–80
  United Nations, 134–36
  United States, 16, with charts, 102–05
Ecuador, 65, 117
Education
  apartheid, in South Africa, 122
  automobile driving, with illus., 192–93
  communist countries, 128, 137, 140, illus., 129
  high-school campuses, with illus., 344–45
  MPATI, with illus., 338–40
  music, 324
  rural libraries, with illus., 302–03
  science teaching, with illus., 341–43
  segregation, with illus., 88–89
  Soviet Union–U. S., with illus., 123–26
  statistics, 149, 348–49
  student exchange, 351, statistics, 350
  teaching machines, with illus., 335–37
  team teaching, with illus., 332–34
  United States, with illus., 328–31
  university architecture, illus., 346–47
Eichmann, Adolf, 63, 65, illus., 64
Eisenhower, Dwight D., 16, 23, 28–30, 71, 101, 119, 132–33, 265, with illus., 53–64, 115, illus., 50, 81, 82
Elections
  Canada, with illus., 35–37
  gubernatorial and congressional, 156–57
  Kennedy-Nixon debates, 362–63, illus., 366–67
  United States, 75–76, with illus., 91–93
Electoral college, 100–01
Electricity, 104, with illus., 247–48
Electronics, illus., 18
  Japan's industry, 177
  miniaturization of components, with illus., 185–87
  SABRE, 164
  teaching machines, with illus., 335–37
  thermoplastic tape, with illus., 249–51
Electrons in ionosphere, 221–22
Emmy awards, 364
Employment, executives, 179–81
  statistics, 198–99
Engineering, 273–74
  education in Soviet Union, 124, 126
  explosives, use of, 182–84
  water-pollution control, with illus., 226–28
Engines, rotation combustion, with illus., 252–56
Engleman, Finis E., 331
Espionage, U. S., 28–30, 61
Eurick, Alvin C., 331
Europe
  art exhibitions, 290–93
  music highlights, 314–17
Evanston Township High School, Ill., 334
Events of 1960, with illus., 16–23, 50–79
Executive recruiters, with illus., 179–81
Exhibitions
  art, with illus., 290–93
  bowling matches, 400
Experiments, for science students, 342, illus., 341, 343
Experts, need for, with illus., 24–25
Exploration
  natural-gas fields, 190
  space, 40–44, with illus., 257–62
Explorers, satellites, 241, 279
Explosives, with illus., 182–84
Exports, see Trade

F

F_2 layer of ionosphere, 221–22
Fahrenheit, Gabriel Daniel, 246
Farm collectivization, 127–30
Farm subsidies, with illus., 94–96
Federal Communications Commission, 362, 363, 368
Federal Trade Commission, 52, 57
Fellows, Harold E., 363
Festivals
  music, 314, 316–17
  Shakespeare, 376
Field and track, illus., 407
Figure in a Carpet, ballet, 301, illus., 298
Fillipeschi, Mario, illus., 319
Film libraries, 302
Finance
  aid for research and development, 144
  Canada, trade deficit, with illus., 26–27
  consumer credit, with illus., 169–72
  education, 331
  statistics, 200–01
Finisterre, yacht, illus., 405
Finland, 72
First National City Bank of New York, 172
Fischer, John H., 330
Fisheries, three-mile limit, 106–07
Fishing, tackle, with illus., 391–93
Flowers, wild, gardening, with illus., 388–90
Fonteyn, Margot, 300
Food
  consumption, statistics, 284–85
  testing for impurities, illus., 24
Football, illus., 409
  professional, with illus., 396–98
  statistics, 417
Ford, Frederick W., 363–64

Ford, Paul, illus., 374
Ford Foundation, 315, 316, 340
Foreign exchange, see Finance
Foreign films, 356–57
Foreign relations, see International relations
Foreign students in U. S., 350, 351
Foreman, Andrew, illus., 21
Formosa, see Taiwan
Foundations, education, views on, 331
Frames, in teaching machines, 335–37
France
  Algeria, with illus., 50–51
  events, 16, 21, 52, 54, 57–60, 65, 72–77, illus., 17
  nuclear weapon tests, with illus., 53
  oil in Sahara, with illus., 111–14
Frank, Julian Andrew, 51
Fraser, Neale, illus., 407
Frederik, King, Denmark, illus., 82
Freeman, Orville L., 77
Frick, Ford, with illus., 46–47
Frondizi, Arturo, 118–19
Frost, Leslie M., 35–36, illus., 37
Fuel, 246–47, 266
Furniture, Danish, modern, illus., 294–97

G

Gable, Clark, illus., 84
Gabon, 70, 147
Games, see Sports and names of sports
Gardens, wild flowers, with illus., 388–90
Gas, natural, Sahara, 112, 114
Gases, liquid, 246
Gates, Thomas S., 265
Geis, Karl, 403
General aviation, with illus., 162–63
Geneva conferences, 54–55, 59–62, 106–07
Geology, disturbances, geologic, 229–31
Geophysics, highlights, 274–75
George Washington, submarine, 262, illus., 258
Germany
  communism, in East, 130
  events, 52, 59, 63, 71–73
  student exchange, 351
  theater, 376
Gerontology, with illus., 232–34
Ghana, 52, 68, 77, illus., 69
Gilpatrick, Roswell, 77–78
Ginsberg, Allen, 99
Giselle, ballet, 301
Glenn, William E., 249, with illus., 251
Goldberg, Arthur J., 77
Golf, illus., 407
Gompertz, Benjamin, 233, 234
Gomulka, Wladyslaw, 128, 129
Gould, Glenn, with illus., 319
Government, See International relations
Graduation Ball, ballet, 299, illus., 300
Grant, Ulysses S., books about, 312
Graphs, see Statistics
Grass, with illus., 214–16
Great Britain
  cancer research, 224–25
  events, 52, 55, 59–62, 68, with illus., 74–77
  motion pictures, 356
  Princess Margaret engagement, 55, illus., 54
  student exchange, 351
Great Britain (cont.)
  twelve-mile limit, 107
Green Bank, West Virginia
  radiotelescope, 218, illus., 217
Greenland, 73
Greenwood, Leila, illus., 375
Grimes, Tammy, 375, illus., 374
Gromyko, Andrei, 29
Guanabara, Brazil, 117
Guantanamo Bay, Cuba, illus., 76
Guided missiles, 18, 258, 260, 262, with illus., 259
  United States-Soviet Union, with illus., 263–67
Guinness, Alec, 364, illus., 365
Gunpowder, explosive, 182
Gursel, Cemal, 61–62
Gutts, Patricia, illus., 363

H

Hagarty, James, with illus., 64
Hahn, Otto, 269
Hammarskjold, Dag, 34, 66, 71, illus., 69, 80, 136
Harrison, Benjamin, 101
Hartford, Connecticut, pay TV, 371
Harvard University, teaching machines, 335
Hawaii
  music, with illus., 314–15
  tidal waves, 231, with illus., 229
Hayes, Rutherford B., 101
Health
  insurance, statistics, 206–07
  water-pollution control, 226–28
  See *also* Medicine
Heart disease, weight factor in, 236
Heat balance, 241
Hebert, Jay, illus., 407
Heggtveit, Anne, illus., 406
Helicopters, 143, 144, 167, illus., 168
Helium liquefier, 246–47
Herter, Christian, 29–30, 58–59, 61, illus., 50
Hi-fi sets, with miniature components, 186–87
Highlights, 1960, with illus., 16–23
Highways, statistics, 149
  traffic safety, 191–93
  United States, future needs, 105
Hiroshima, Mon Amour, movie, 357, illus., 354
Hobbies, gardening, with illus., 388–90
  shell collecting, with illus., 394–95
  ship-model building, with illus., 386–87
Hockey, illus., 404
  Olympic games, 412
Hodges, Luther H., 77
Holidays, 420
Holland, James, 335
Horse racing, illus., 408
Hospitals, statistics, 282–83
Hostage, The, play, with illus., 375
Hound Dog, missile, 267
Houses and housing
  high-school campuses, with illus., 344–45
  motels, with illus., 197
  Mystic Seaport, Conn., with illus., 304–06
  new UN members, 136
  South Africa, 122, illus., 120
  United States, future in, 103, 104–05
Hungary, 130
Hurricanes, detection of, 238

Hussein, Dato Abdul Razak bin, illus., 81
Hutchins, Robert M., 329
Hydraulic pumps, miniature, 187, illus., 185
Hydrogen, atomic, in atmosphere, 222
Hydrogen, universal wave length, 219

I

IGY, see International Geophysical Year
Icebreaker, Soviet, nuclear-powered, illus., 144
Iceland, fishery protection, 106, 107
Ikeda, Hayato, illus., 82
Illinois, high schools, 334, illus., 344
Immigration
  Australia, 109–10
  Canada, statistics, 154–55
Imports, see Trade
Income
  family, chart, 104
  farm subsidies, 94–96
India, events, 52, 54, 61–62
Indochina, communism, 138
Indonesia, 62, 70, 138–39, illus., 137
Industries
  Australia, with illus., 108–10
  communist industrialization, 127–30
  executive recruiters, with illus., 179–81
  Japan, with illus., 176–78
  motels, with illus., 195–97
  natural gas, Canada, with map, 188–90
  petroleum, French, with illus., 111–14
  Russia and United States, with illus., 141–45
  statistics, 198–99
  United States, future in, 103–04
  waste treatment, with illus., 226–28
  See also Business, Economics
Influenza, control of, 224, illus., 223
Infrared radiation, 241
Ingrid, Queen, Denmark, illus., 82
Installment buying, 108, 169, 172, illus., 170
Instruments, weather and climate, 220
Insurance, health, statistics, 206–07
Integration, see Segregation
Intelligence operations, 28–30, 263–67
Inter-American Development Bank, 118
Intercontinental ballistic missiles, 257–60, 262–67
Interest rates, on loans, 169–72
Intermediate ballistic missiles, 258, 262, 264, illus., 259
International Geophysical Year
  weather studies, 220
International relations
  cartoons, 38–39
  communism and the West, with illus., 31–34
  Japan, 177–78
  Latin America, 115–19
  orchestral tours, with illus., 314
  sovereignty over coastal waters, 106–07
  space research, 41–44
  student exchange, with statistics, 350–51
  U.S.S.R.–U. S., 28–30, 61, with illus., 141–45
  world diplomacy, with illus., 131–33
International Telemeter Corporation, 370
Ionosphere, study of, 220–22
Iran, 19, 75, illus., 82
Ireland, 55
Isis, Temple of, 270, illus., 271
Israel, 53–55, 63
Italy, 55, 58, 61, 67
Ivory Coast, 70, 147

J

Jacabsen, Arne, illus., 295
Janol method, blasting, 183
Japan, 52–77, with illus., 63–64, illus., 73
  judo, 402
  music highlights, 314
  tidal waves, with illus., 229–31
  trade, with illus., 176–78
  United States, relations with, 33
Javits, Jacob K., with illus., 40
Jefferson, Thomas, 100–01
Jet planes, with illus., 166–67
Johansson, Ingemar, illus., 406
Johnson, Henry C., 242
Johnson, Lyndon B., 32, 77, 267, with illus., 91–93
Johnson, Rafer, illus., 407
Jordan, 70–71
Judo, with illus., 402–03
Juhl, Finn, illus., 294
Jujitsu and judo, 402

K

Kabuki theater, 375
Kano, Jigoro, 402
Kasavubu, Joseph, illus., 83
Katanga Province, Africa, 56, 68–69
Keats, John, 329
Kelvin, William Thomson, 246
Kennedy, Jacqueline, illus., 23
Kennedy, John F., 16, 23, 52–79, 362–63, with illus., 91–93, illus., 22, 366–67
Kennedy, Robert F., 77
Kerouac, Jack, 98–99
Khrushchev, Nikita, 28–30, 53–76, 132, 133, 141–45, with illus., 31–34, illus., 80, 363
Kishi, Nobusuke, 63–64, illus., 50
Kit models, ship, 386–87
Kittinger, Joseph, Jr., 270, illus., 271
Kjaerholm, Poul, illus., 294
Kong Le, 70, illus., 69
Korea, 58–59, 65, 68
Kozlov, Frol, 29
Kramer, Ingrid, illus., 409
Kubitschek, Juscelino, 115, 117

L

La Fille Mal Gardée, ballet, 300–01
Labor, statistics, 198–99, 208
  See also Strikes
Laboratories, scientific, with illus., 341–43
Ladewig, Marion, illus., 408
Languages, school enrollment, 349
Laos, 70–75, 137, 138, illus., 69, 139
Lassen, Flemming, illus., 295
Latin America
  economics, statistics, map, 210–11
  events, 53, with illus., 115–19
  United Nations, influence in, 134–36
  See also names of countries
Law, international, 106–07
Lawns, grass, with illus., 214–15
Leaders, wire, for fishing, 392–93
Lenin, nuclear-powered ship, illus., 144
Lesage, Jean, with illus., 67, illus., 37

Leukemia, control of, 223–24
Libraries, rural, with illus., 302–03
Lieberman, Myron, 331
Lincoln, Abraham, books, with list, 311–13
Lines, new fishing, 392
Liquefiers, 246–47
Literacy campaign, in Russia, 123–24
Literature, see Books
Loan companies, 171
Loans, price-support, 94–95
Lodge, Henry Cabot, 65, 93, with illus., 40–43, 61, illus., 92
Long Island University, illus., 347
Longevity, study of, with illus., 232–36
Lumumba, Patrice, 66, 67, illus., 83, 136
Lunch-counter sit-ins, with illus., 88–89
Lures, fishing, 393, illus., 392–93

M

McBride, Patricia, illus., 298
McElroy, Neil H., 263
McGinley, Laurence J., 43, illus., 41
MacKenzie, Mary, 315, illus., 317
Macmillan, Harold, 34, illus., 32, 81
McNamara, Robert S., 77
Magazines, advertising statistics, 202–03
Magnetic field of earth, 222
  superconductors, 248, illus., 247
Magnetic tape, 249–50
Malagasy Republic, 146
Malaria, statistics, 286
Malaya, communism, 138–40
Mali, 70, 146
Manning, Ernest C., 35, illus., 37
Maps
  Africa, 146
  Asia, 147
  Canadian-American natural gas, 188–89
  Latin America, cost of living, 210
  malaria areas in world, 286
  population, United States, 151
Margaret, Princess, Great Britain, 19, 55, 62, illus., 54
Marin, Muñoz, 74, illus., 76
Marquand, John P., illus., 85
Martin, John, 299
Martin, William H., 72, illus., 71
Marx, Karl, 127
Maryland, high school, illus., 344
Masers, 247, 272, illus., 273
Massachusetts, education, 334, illus., 345
Matter, particles, 280
Matthews, Kerwin, 358, illus., 355
Mauritania, Republic of, 147
Mazeroski, Bill, illus., 405
Mead, Margaret, 43–44, illus., 41
Measuring devices, upper atmosphere, 220–21
Mechanical devices, miniature, 187, illus., 185
Medicine
  Air Ambulance, 160–61
  bead thermisters and radiation detectors, 186
  highlights, with illus., 275
  longevity, study of, 232–34
  statistics, 206–07, 282–83, 286
  virus infections, control, with illus., 223–25
Meitner, Lise, with illus., 268–69
Memory units, in computers, 248
Menderes, Adnan, 58, 61–62
Mental illness, statistics, 282–83
Menzies, Robert, 109
Mercury, Project, 261
Metals, 184, 247–48
Meteorology, see Weather
Metropolitan Life Insurance Company
  weight, with tables, 235–36
Metropolitan Museum of Art, with illus., 290–92
Metropolitan Opera, with illus., 315–16, 322–23
Mexico, 116, illus., 346
Miami, University of, illus., 347
Midas, satellite, 260, 279
Midwest Program Airborne Television Instruction, with illus., 338–40
Military strength
  U. S.-Soviet Union, 141–45, with illus., 263–67
Milky Way Galaxy, 218
Miniaturization, with illus., 185–87
Minuteman, ICBM, 262
Missiles, see Guided missiles
Mitchell, Bernon F., 72, illus., 71
Molecular electronics, 186–87
Mollusks, 394
Money, see Finance
Montana, libraries, with illus., 303
Montreal, University of, illus., 346
Moon, landings on, 262
Morocco, 55–57, illus., 54
Morris, Aubrey, illus., 375
Mortality
  disease and aging, relationship, 232–34
  weight factor in, 235–36
Motels, with illus., 194–97
Motion pictures
  Bergman, Ingmar, with illus., 359–61
  foreign films, statistics, 381
  pay TV, 371
  prizes and awards, 382–83
  review, 19, with illus., 354–58, illus., 21
  thermoplastic recordings, 250
Mowing, of grass, 216
Mufleh, A., illus., 81
Mulch, in wild flower gardens, 390
Muliken, Bill, illus., 408
Mumps, vaccine for, 225
Museum of Modern Art, 292–93
Museums, exhibitions in, with illus., 290–93
  Mystic Seaport, with illus., 304–06
Music
  highlights, with illus., 314–17, 324
  Latin America, 119
  Nilsson, Birgit, with illus., 322–23
  prizes, 325
  recordings, with illus., 318–21
  television, 365
Musical instruments, statistics, 324
Mutations, virus, 224–25
Mystic Seaport, Conn., with illus., 304–06

N

NSU rotary engine, 254–56
Nardone, Benito, 117
Nasser, Gamal Abdel, illus., 81
National Aeronautics and Space Administration (NASA), 261–62

National Air Taxi Conference, 160–61
National Association of Broadcasters, 363
National Defense Education Act, 343
National Energy Board, Canada, 188, 190
National Football League, 397–98
National Gallery of Art, with illus., 290–92
National income, Australia, 109
National Safety Council, 191, 192, 193
National Science Foundation, 343
Natural gas, Canada, with map, 188–90
Naumburg Foundation, 315
Navigation, Transit, satellite, 260
Navy, U. S.
  aircraft, 168
  twelve-mile limit, 107
Negroes
  apartheid, 54, with illus., 56, 59, 120–22
  civil rights, with illus., 88–90
Nehru, Jawaharlal, illus., 81
Nepal, 66
Netherlands, events, 60
Neutrons, from cosmic rays, 222
Nevins, Allen, 311–12
New Hampshire, motel, illus., 197
New Jersey
  bookmobiles, 303
  bowling center, Edison, with illus., 400
New Orleans, integration, 75
New York
  art exhibitions, with illus., 290–93
  Beats, with illus., 97–99
  conventions, 173–75
  Long Island University, illus., 347
New York City Ballet, 301, illus., 298
New York City Opera, with illus., 316
New York International Airport, with illus., 165
News events, with illus., 16–23, 50–79
Newspapers, advertising, statistics, 202–03
Newton South High School, Newton, Mass., illus., 345
Ngo Dinh Diem, illus., 138
Nieder, Bill, illus., 408
Niger Republic, 70, 147
Nigeria, 73, 147
Nike-Zeus, defense weapon, 262
Nilsson, Birgit, with illus., 322–23
Nimbus, weather satellite, 239, 241
Nitroglycerin, explosive, 182
Nitze, Paul H., 78
Nixon, Richard M., 58, 362–63, with illus., 91–93, illus., 366–67
Nkrumah, Kwame, illus., 81
Nonell, Isidro, illus., 293
Norstad, Lauris, 34
North Hagerstown High School, Hagerstown, Md., illus., 344
North Vietnam, see Vietnam
Nuclear devices
  France, weapon testing, with illus., 53
  test bans, 54–56, 59–62
  Triton, submarine, with illus., 62–63
Nuclear energy, see Atomic energy
Nucleic acid, 224–25
Nutrition, values and statistics, 284–85
Nuvistors, miniature vacuum tubes, 186

O

Obituaries, with illus., 84–85
Ocean, three-mile limit, 106–07
Oceanography, 52–53, illus., 25
Off-Broadway theater, 375–76
Oil, see Petroleum
Okada, Eiji, illus., 354
Olympic games, 55, with illus., 412–15, illus., 404–09
Ondine, ballet, 299–300
Open End, TV, illus., 363
Opera
  highlights, with illus., 315–16
  Nilsson, Birgit, with illus., 322–23
  recordings, 318–21
  statistics, 324
Orchestras, symphony, with illus., 314–17
  recordings, 318–21
Organization of American States (OAS), 68, 116
Oriental art, exhibitions of, 291, illus., 290
Oxygen, liquid, 246, 247
Ozma, Project, 218

P

Paar, Jack, 368, illus., 364
Pakistan, 52, 65, 73–75
Palais de Chaillot, Paris, illus., 131
Panama, 62, 117
Panton, Vernon, illus., 296
Paris
  Palais de Chaillot, illus., 131
  theater highlights, 376
Parity farm prices, 96
Particles, matter, 222, 280
Pass laws, in South Africa, 122, illus., 121
Pasternak, Boris L., illus., 85
Patents, 275–76
Patterson, Floyd, illus., 406
Pay TV, with illus., 369–72
Paz Estenssoro, Victor, 117
Peabody awards, 364–65
Pennsylvania, University of, illus., 347
Pepe, movie, illus., 357
Peru, events, 118–19
Petrochemical industry, France, 114
Petroleum
  explosives in prospecting, 183
  refinery, Australia, illus., 110
  Sahara, with illus., 111–14
Pettit, Bob, illus., 406
Philippines, communism, 138, 139–40
Photography
  birds in flight, with illus., 242–45
  thermoplastic tape, 250
  weather satellites, 260, with illus., 237–41
  X ray of sun, with illus., 271
Physics
  atmosphere, study of, 220–22
  education in, 342
  highlights, with illus., 272–73
  low temperatures, study of, with illus., 246–48
  Meitner, Lise, with illus., 268–69
Piazzetta, Giovanni, illus., 292
Pioneers, space probes, 259–60, 279, illus., 258
Pipelines, oil and gas, French, 112
Piper aircraft, 161, 163
Piston engine, 252

- Pittsburgh Pirates, illus., 405
- Planck, Max, 269
- Planets
  - communication with, 217–19
  - space probes, 262
- Plantain, weed, 216, illus., 215
- Plante, Jacques, illus., 404
- Plants
  - grass, with illus., 214–16
  - wild-flower gardening, with illus., 388–90
- Play of the Week, TV, 364
- Plowshare, Project, 184
- Poland, 128, 129–30
- Polaris, IRBM, 262, 266–67, illus., 259, 265
- Poliomyelitis, research, 225, with illus., 275
- Politics
  - books about, 307
  - Canada, with illus., and map, 35–37
  - conventions, with illus., 173
  - electoral college, 100–01
  - politicians, 24
  - TV coverage, 362–63, 365, illus., 366–67
- Pollution, water, control, with illus., 226–28
- Population
  - Australia, 109–10
  - Canada, statistics, 154–55
  - education, statistics, 348–49
  - Soviet Union, statistics, 153
  - United States, 150–52, with chart, 102–04
- Portugal, 63
- Post, Emily, illus., 84
- Powell, C. Percy, 311
- Power, Thomas S., 264–65
- Powers, Francis Gary, 29–30, 166, illus., 83
- Prado Urgarteche, Manuel, 118–19
- Pressey, Sidney, 335, 337
- Price-support programs, with illus., 94–96
- Prinzes, NSU, 255–56
- Private flying, with illus., 162–63
- Prizes and awards
  - books, music, art, 325
  - international, 418
  - music, 315
  - Olympic games medal winners, 415
  - show business, 374, 382–83
  - TV awards, 364–65
- Production
  - Russia, with illus., 141–45
  - United States, future in, 102–04
- Programed instruction, 335–37
- Programs, pay TV, 371–72, illus., 370
- Proviso West High School, Hillside, Ill., illus., 344
- Psychiatry, highlights, 276–77
- Psychology, highlights, with illus., 276–77
- Public libraries, with illus., 302–03
- Puerto Rico, 74, with illus., 76
- Pulitzer prizes, 315, 325
- Pumps, miniature hydraulic, 187, illus., 185

Q

- Quadros, Janio, 117, illus., 119
- Quiz, 418–19

R

- RB-47 incident, 67
- Radar
  - satellites tracked by, 221
  - thermoplastic recordings, 250–51
- Radar (cont.)
  - weather study, 241
- Radiation, in atmosphere, 241, with illus., 221–22
- Radiation detectors, miniature, 186
- Radio, see Television and radio
- Radioactivity, water-pollution control, 227
- Radiotelescopes, 218–19, illus., 217
- Ranger, Project, 261–62
- Rats, used in research, 232–33, 234
- Reconnaissance, aerial, see Aerial reconnaissance
- Recording, thermoplastic tape, with illus., 249–51
- Recordings, music, with illus., 318–21
- Red China, see China
- Reels, fishing, 391–92
- Reference books, Civil War, 311–13
  - libraries, 303
- Renaissance, 24
- Reprints, Civil War books, 312–13
- Republican Party, 91–93
- Research
  - longevity, study of, 232–34, 235–36
  - low temperatures, with illus., 246–48
  - miniaturization, with illus., 185–87
  - Russia and United States, 142–45
  - scientific, for students, 341–43
  - space, 40–44
  - United States, future in, 103, chart, 105
  - virus infections, control, with illus., 223–25
- Reservations, airline, with illus., 164–65
- Reza, heir to Iranian throne, illus., 82
- Rhee, Syngman, 58
- Rhodesia, 68
- Ribicoff, Abraham A., 77
- Rickover, Hyman G., 330, 331, illus., 328
- Riots
  - Korea, 58
  - Turkey, 58–59
- Riva, Emmanuelle, illus., 354
- RKO General, Inc., 371
- Roads, see Highways
- Robichaud, Robert L., illus., 37
- Robinson, Jackie, 47, illus., 46
- Roblin, Dufferin, 35–36, illus., 37
- Rockefeller, John D., Jr., illus., 84
- Rockefeller, Nelson, 93
- Rockets
  - fuels, 246
  - sounding and cosmic, 220–21
- Rods, fishing, with illus., 391
- Roosevelt, Eleanor, 44, illus., 42
- Roosevelt, Franklin D., 132, illus., 133
- Rossi-Lemeni, Nicola, illus., 319
- Rotating combustion engine, with illus., 252–56
- Royal Ballet, with illus., 299–301
- Royal Danish Ballet, 301
- Rudolph, Wilma, illus., 407
- Rumania, 66, 130, with illus., 31
- Rural libraries, with illus., 302–03
- Rusk, Dean, 77
- Russia, see Union of Soviet Socialist Republics

S

- Sabin, Albert, 225
- Sabotage, on airliners, 51
- SABRE, electronic system, 164
- Safety, traffic, with illus., 191–93

Sahara, oil fields, with illus., 111–14
  test of nuclear device, with illus., 53
Salaries, teachers, 334
  theater, 379
San Francisco, Beats, 97–99
San Jose, OAS meeting, 68, 116
Satellites, man-made, 278–79, with illus., 257–60
  space, study of, 220–21
  thermoplastic recordings from, 251
  weather, with illus., 237–41
Saturn, space vehicle, 262
Saulnier, Raymond J., 172
Schlesinger, Arthur, Jr., 44, 307, illus., 43
Schloredt, Bob, illus., 409
Schools, see Education
Schriever, Bernard A., 264–65
Schwartz, Steven O., 223–24
Science
  education in, 124–26, 330–31
  highlights, with illus., 270–77
  low temperatures, with illus., 246–48
  miniaturization, with illus., 185–87
  particles and antiparticles, 280
  prizes and awards, 287
  Russia and United States, 141–45
  scientists, with illus., 24–25
  teaching of, with illus., 341–43
  thermoplastic tape, with illus., 249–51
  tidal waves, 229–31
  water-pollution control, with illus., 226–28
  See *also* Space, outer and specific sciences
Scrambled textbook, 337
Seat belts, for automobiles, 192, illus., 191
Segregation, 20–21, 75, with illus., 88–90
  apartheid, 54, with illus., 56, 59, 120–22
Sellers, Peter, 19, illus., 21
Senate, U. S., with illus., 57
Senegal, 70, 146
Serrano, Lupe, 298, 299, illus., 301
Service industries, statistics, 198
Seventh Seal, movie, 359, 360, illus., 361
Shakespeare festivals, 376
Shaw, Walter R., illus., 35
Shell collecting, with illus., 394–95
Shepard, Francis P., 231
Ship-model building, with illus., 386–87
Shippingport, Pa., atomic power plant, 281
Ships and shipbuilding
  Australia, illus., 108
  fishing schooner, illus., 106
  icebreaker, Soviet, nuclear-powered, illus., 144
  Mystic Seaport, museum, with illus., 304–06
  Triton, submarine, with illus., 62–63
Sikorsky S-61, 167, illus., 168
Silver, Abba Hillel, 44, illus., 43
Silver, Danish, illus., 295
Singapore, communism, 140
Sit-ins, lunch counter, with illus., 88–89
Skating, Olympic games, with illus., 412
Skiing, Olympics, with illus., 412, illus., 406
Skinner, B. F., 335–36, 337
Skoblikova, Lidya, illus., 412
Skrowaczewski, Stanislaw, 314, illus., 317
Skybolt, missile, 262, 267
Slumps, in baseball, with illus., 45–47
Smallwood, J. R., 35, illus., 37
Smith, Elizabeth R., 78
Smith, Howard K., illus., 365
Smith, Mortimer, 330
Social controls, communist countries, 128–30
Social Credit party, Canada, 35, 36
Somalia, Republic of, 65, 67, 146
Sounding rockets, 220
South Africa, see Union of South Africa
South America, see Latin America
South Vietnam, see Vietnam
Southeast Asia, with illus., 137–40
Southern Regional Council, 90
Southern Rhodesia, see Rhodesia
Soviet Union, see Union of Soviet Socialist Republics
Space, outer
  advances, 18, 52, 54–55, 60–62, 142–43, 278–79, with illus., 257–62, 277
  atmosphere, study of, 220–22
  attempt to conquer, with illus., 40–44
  dangers of travel in, 222
  interstellar communication, with illus., 217–19
  miniaturization in vehicles, 185–86
  thermoplastic recordings, 251
  weather satellites, with illus., 237–41
Spain, 68, 293
Spartacus, movie, 354
Spears, Robert V., 51
Sports, 20, illus., 404–09
  bowling, with illus., 399–401, illus., 408
  fishing tackle, with illus., 391–93
  football, professional, with illus., 396–98
  judo, with illus., 402–03
  Olympic games, 413–15, with illus., 412
  slumps, cause of, with illus., 45–47
  statistics, 416–17
Squaw Valley, Calif., illus., 406
Stalin, Josef, 131, illus., 133
Standard of living
  Australia, 108–09
  consumer credit, 169–72
  Japan, 177
  Soviet Union, 125
  United States, future in, 102–03
Stanfield, Robert L., 35–36, illus., 37
Statistics
  accidents, motor vehicle, 205
  advertising, 202–03
  Africa, new nations, 146–47
  aviation, 204
  budget and taxes, 148–49
  Canada's balance of trade, 27, 201
  census, 103, 150–55
  consumer credit, 171
  education, 149, 348–50
  food consumption, 284–85
  foreign films, 381
  health insurance, 206–07
  highways, 149
  immigration, Canada, 154–55
  income, distribution, 104
  labor unions and strikes, 208
  Latin America, economy, 210–11
  malaria, fight against, 286
  medical costs, 206–07

Statistics (cont.)
  mental illness, 282–83
  music, interest in, 324
  production, China and U. S. S. R., 209
  research expenditure, 105
  sports, 416–17
  trade, 200–01
  travel, world, 410–11
  vital statistics, Canada, 154–55
  weight tables, 235
Stengel, Casey, illus., 47
Stepinac, Alojzije Cardinal, illus., 85
Stern, Isaac, illus., 318
Stevenson, Adlai, 77, 101
Storms, detection of, 237–38, illus., 240
Strassmann, Fritz, 269
Strategic Air Command, 168, with illus., 264–67
Strikes, 208, 356, with illus., 377, illus., 378
Strode, Hudson, 312
Student-exchange program, 350–51
Submarines, 262, 266–67, with illus., 62–63, illus., 258
Subsidies, farm, with illus., 94–96
Sugar, price support, 95
Sukarno, Ahmed, illus., 81
Summit conferences, 29–30, with illus., 131–33
Sunrise at Campobello, movie, 358, illus., 356
Suomi, Verner, 241
Superconductivity, with illus., 247–48
Supreme Court, U. S., 88–89, 107
Surgery, see Medicine
Surpluses, farm, 94–96
Susskind, David, illus., 363
Sutton, Dudley, illus., 375
Sweden
  Bergman, Ingmar, with illus., 359–61
  Nilsson, Birgit, with illus., 322–23
  theater, 376
Swimming, illus., 408–09
Switzerland, events, 54–66, 68
Sydney, Australia, 109, illus., 108

T
Tu-114, Soviet transport, 143
Tackle, fishing, with illus., 391–93
Tactical Air Command, 168
Taiwan, 64, 74
Tallchief, Maria, 299, illus., 301
Taxes, U. S., statistics, 148–49
Teaching, see Education
Teaching machines, with illus., 335–37
Technology, advances, 273–74
  airline services, 164
  Japan, 176–78
  petroleum industry, French, with illus., 111–14
  United States, future in, 103–05
  See also Science
Telemeter, TV, 369–71
Teletickets, air-travel tickets, 165
Television and radio
  advertising, statistics, 202–03
  Japan's industry, 177
  Kennedy-Nixon debates, illus., 366–67
  motion pictures and TV, 356
  MPATI, with illus., 338–40
  music highlights, 316, 324
Television and Radio (cont.)
  pay TV, with illus., 369–72
  prizes and awards, 382–83
  review, with illus., 362–68
  satellites broadcast, 219–21, 260
  thermoplastic recordings, 250, illus., 251
Temperatures, atmospheric, 221–22, 241
  low, study of, with illus., 246–48
Tennis, illus., 407
Terminals, airline, with illus., 165
Tests, school, 329–30
  scored by machine, 335–37
Theater, 19–20
  economics, with illus., 377–80
  prizes and awards, 382–83
  review, with illus., 373–76
  See also Motion pictures, Television and radio
Thermoplastic tape, with illus., 249–51
Thomas, Terry, illus., 21
Thor missiles, 258, 259, 260
Three Worlds of Gulliver, movie, 358, illus., 355
Thulin, Ingrid, 360–61
Thurber, James, 375–76, illus., 374
Tidal waves, with illus., 229–31
Tiger at the Gates, TV, illus., 363
Tilden, Samuel J., 101
Tiros, satellite, 260, 279, with illus., 237–39
Titan, ICBM, 262
Tito, Marshal, 128, illus., 81
Togo, 61, 146
Tourism, see Travel
Tourist homes and cabins, with illus., 194–95
Trade
  Australia, 109
  Canada, 188–90, with illus., 26–27
  Japan, with illus., 176–78
  statistics, 200–01, 210–11
  See also Economics
Traffic safety, 191–93
Transistors, 185–86
Transits, satellites, 260, 279
Translators, Soviet, 124–25
Transmitters, TV air-borne, 339
Transportation
  safety on highways, with illus., 191–93
  Soviet Union, 143–45
  See also Aviation
Travel
  air, with illus., 160–68
  heads of state, 131–33
  motels, with illus., 194–97
  world travel, statistics, 410–11
Triton, nuclear submarine, with illus., 62–63
Trujillo, Rafael Leonidas, 116
Trump, J. Lloyd, 332
Tshombe, Moise, 66, with illus., 69
Tsunamis, with illus., 229–31
Tunisia, 60–61, 65, 67, 75
Turf grass, with illus., 214–16
Turkey, 58–59, 61–62
Turn of the Screw, TV, with illus., 364
Twining, Nathan F., 265–66

U
U-2 incident, 17–18, 28–30, 61, 166
Udall, Stewart L., 77

Uganda, student exchange, 351
Union of South Africa, 74
  apartheid, 54, with illus., 56, 59, 120–22
Union of Soviet Socialist Republics
  American Ballet Theatre, 298–99, illus., 300–01
  aviation developments, 166
  census, statistics, 153
  communism and economics, 127–30, 137–40
  economic war with U. S., with illus., 141–45
  education, with illus., 123–26
  events, 52–77
  foreign policy, 131–33
  missiles race, 263–67
  production statistics, 209
  space, advances in, 257, 278–79
  U-2 incident, 17–18, 28–30, 61, 166
  UN, new influence in, 134–36
  virus infections, research on, 224, 225
  world affairs, with illus., 31–34
Unions, trade
  apartheid, in South Africa, 122
  theater, 379
United Arab Republic, 52, 54, 62–63, 68
United Nations, 34, 40–42, 52–77, 106–07, 122, with illus., 134–36, illus., 80–81
United States
  art exhibitions, with illus., 290–93
  Australia, business in, with illus., 108–10
  civil rights, with illus., 88–90
  Cuba, 32–33
  defense, with illus., 263–67
  economics of future, with charts, 102–05
  elections, 100–01, 156–57, with illus., 91–93
  events, with illus., 50–79
  farm subsidies, with illus., 94–96
  foreign policy, 131–33
  Japan, relations with, 177–78
  sovereignty over coastal waters, 106–07
  Soviet Union, 32–33, with illus., 123–26, 141–45
  statistics, 148–52, 171, 202–03, 206–08, 282–85, 410–11
  student exchange, with statistics, 350–51
  UN, new influence in, 134–36
  water-pollution control, with illus., 226–28
United States Coast and Geodetic Survey, 231
Universities, see Education
Unsinkable Molly Brown, play, 375, illus., 374
Upper Volta, 70, 147
Uruguay, 55, 57, 117

V
Vaccines, to control virus infections, 223–25
Van Allen, James A., 221–22
Van Allen radiation belts, with illus., 221–22
Van Brocklin, Norm, illus., 409
Van Eyck, Jan, 290, illus., 293
Vanguards, satellites, 279
Velasco Ibarra, Jose Maria, 117
Venetian Way, race horse, illus., 408
Venezuela, 77, 119, illus., 117
Verwoerd, Hendrik F., with illus., 59
Vietnam, 61, with illus., 137–38, 140
Virus infections, control, with illus., 223–25
Volcanoes, eruption, 229
Voltaic Republic, see Upper Volta
Voting
  electoral college, 100–01
  Negro rights, 90
  new UN members, 134
Vuarnet, Jean, illus., 412

W
Wages, see Salaries
Wankel, Felix, 252, 254–56
Ward, Barney, illus., 47
Warning systems, defense, 264, illus., 263
Washington National Airport
  Airwayte, motel, 196
Water, United States, future needs, 105
Water-pollution control, with illus., 226–28
Wave lengths, interstellar communication, 218–19
Wayland Senior High School, Mass., illus., 345
Weapons
  ban of nuclear weapons, 54–56, 59–62
  missile race, with illus., 263–67
Weather, study of, 220
  satellites, 260, 278, with illus., 237–41
Weeds, control of, 216, illus., 215
Weight, effect on mortality, 235–36
West Berlin, see Berlin
West Germany, see Germany
West Virginia, Greenbank
  radiotelescope, 218, illus., 217
Wheat, price support, 94–95, 96
Whitefish, Montana, library, with illus., 303
Whitton, Rex M., 78
Wicked Scheme of Jebel Deeks, TV, 364, illus., 365
Williams, G. Mennen, 77
Williams, Kenneth P., 312
Wind direction, study of, 238
Woodring, Paul, 330–31
Wool, price support, 95
World series, baseball, illus., 405

X
X-15, research plane, 260–61

Y
Yachting, illus., 405
Young Men's Christian Association
  judo, 403
Young people, films for, 358
Young Women's Christian Association
  judo, 403
Yugoslavia, communism and economics, 128

Z
Zen Buddhism, 98
Zenith Radio Corporation, 371
Zoysia grass, 216
Zuckert, Eugene M., 78

Don Gibbons